
NOVEMBER 2002

**CHANGE OF MAINTENANCE OPERATIONS AT
PALM BEACH HARBOR AND PEANUT ISLAND
PALM BEACH COUNTY, FLORIDA**

ENVIRONMENTAL ASSESSMENT

NAVIGATION – OPERATIONS AND MAINTENANCE



**U.S. Army Corps
of Engineers**
Jacksonville District
South Atlantic Division



**DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019**

REPLY TO
ATTENTION OF

**CHANGE OF MAINTENANCE OPERATIONS
AT PALM BEACH HARBOR AND PEANUT ISLAND
PALM BEACH COUNTY, FLORIDA
FINDING OF NO SIGNIFICANT IMPACT**

I have reviewed the planning document and the Environmental Assessment (EA) of the considered action. This Finding incorporates by reference all discussions and conclusions contained in the EA enclosed hereto. Based on information analyzed in the EA, reflecting pertinent information obtained and coordinated with Federal and State agencies having jurisdiction by law and/or special expertise, and from the interested public, I conclude that the proposed action will have no significant impact on the quality of the human environment. Reasons for this conclusion are in summary:

1. The work will be conducted in accordance with the requirements of the National Marine Fisheries Service and the U.S. Fish and Wildlife Service to ensure federally listed species (i.e., manatee and sea turtle) are not adversely impacted by the project. The project will not jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of such species critical habitat.
2. Essential fishery habitat will be created, potentially 57 acres.
3. Historic properties included in or eligible for inclusion in the National Register of Historic Places are not likely to be adversely affected within the proposed project area or disposal area.
4. State water quality standards will be maintained, no long-term increases in water turbidity will occur.
5. Measures to avoid or minimize potential adverse impacts to fish and wildlife resources will be implemented during project construction.
6. Area aesthetics will benefit from the removal of exotic tree species and reducing the height of the containment berm at the Port of Palm Beach dredged material storage area.

In consideration of the information summarized, I find that the proposed action will not significantly affect the human environment and does not require an Environmental Impact Statement.

15 NOV 02
Date

James G. May
Colonel, U.S. Army
District Engineer

**NAVIGATION-OPERATIONS AND MAINTENANCE
CHANGE IN MAINTENANCE DREDGING METHODS FOR PALM BEACH HARBOR
AND DREDGE MATERIAL OFFLOADING FROM PEANUT ISLAND
PALM BEACH COUNTY, FLORIDA
ENVIRONMENTAL ASSESSMENT
NOVEMBER 2002**

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SUMMARY

The U.S. Army Corps of Engineers (Corps), Jacksonville District, proposes a change in maintenance operations scheduled for Palm Beach Harbor, and offloading of dredged material stored at the southern end of Peanut Island, in Palm Beach County, Florida. Summer pipeline dredging would replace the scheduled winter hopper dredging and 600,000 cubic yards of stockpiled dredged material would be offloaded from the island's southern terminus at the dredged material storage area (DMSA) maintained by the Port of Palm Beach. During the planned activities, the Port of Palm Beach DMSA would be cleared of nuisance and exotic plants and revegetated with indigenous upland/wetland plant species.

The change in maintenance operations is proposed to economically utilize equipment and resources, to provide dredge material storage capacity for the Port of Palm Beach during maintenance operations for Palm Beach Harbor, and to maximize the opportunity for environmental restoration of Peanut Island during activities proposed under Section 1135 of the Water Resources Development Act of 1996, as amended.

Reconfiguration of the existing berm at the southern terminus is also proposed. The existing berm will be lowered to 32 feet above mean low water from 36 feet above mean low water. Material to be offloaded from the island is proposed for disposal in one of three alternative sites. The disposal alternatives consist of two nearshore placement sites (one south of the Lake Worth Inlet southern jetty and the other at Midtown Beach), within existing beach placement templates, and nearshore within a 99-acre anoxic/tidal depression area (former marine borrow site) adjacent to the shoreline of the Lake Worth Municipal Golf Course, Palm Beach County, Florida.

**ENVIRONMENTAL ASSESSMENT
FOR THE
CHANGE OF MAINTENANCE OPERATIONS
AT PALM BEACH HARBOR AND PEANUT ISLAND
PALM BEACH COUNTY, FLORIDA**

1.0 PROJECT PURPOSE AND NEED

1.1 PROJECT LOCATION.

Peanut Island lies within the north-central area of Lake Worth Lagoon, in Section 34, Township 42 South, Range 43 East, Riviera Beach, Palm Beach County, Florida (Figure 1). Lake Worth Inlet and the Intracoastal Waterway (IWW) form the easterly and westerly boundaries of the island.

1.2 AUTHORITY.

The project is authorized under the 1996 Water Resources Development Act, as amended.

1.3 PURPOSE OF AND NEED FOR ACTION.

The purpose of the action is to change the scheduled winter maintenance dredging of Palm Beach Harbor to summer pipeline dredging and to offload dredge material from the southern end of Peanut Island, at the Port of Palm Beach dredged material storage area (DMSA). These changes would also realize secondary benefits such as maximum and economic utilization of dredge equipment, increase storage capacity for future dredge material disposal, nourish highly erodible shorelines, and create submerged aquatic habitat and/or essential fishery habitat.

1.4 AGENCY GOAL OR OBJECTIVE.

The goals and objectives of the proposed action are to:

- a. Provide material storage capacity for the local sponsor during the planned maintenance dredging of Palm Beach Harbor.
- b. Provide a maximum effort of resources to facilitate the environmental restoration of Peanut Island proposed under Section 1135 of the Water Resources Act of 1996, as amended. The proposed action would benefit Peanut Island environmental restoration with the removal of exotic vegetation at the southern end of the island, creation of wetland habitat and fishery/oyster reefs, and would improve area aesthetics by reconfiguring and lowering the existing DMSA containment berm.
- c. Change the scheduled winter hopper dredging of Palm Beach Harbor to summer pipeline dredging. This action would be cost-effective, allow maximum use and economic benefit of equipment while in the area performing work associated with the environmental restoration of Peanut Island.

1.5 RELATED ENVIRONMENTAL DOCUMENTS.

1.5.1 AUGUST 1997, SECTION 1135, ENVIRONMENTAL RESTORATION REPORT with EA, PEANUT ISLAND, PALM BEACH COUNTY, FLORIDA

The Jacksonville District Corps completed the Peanut Island Environmental Restoration Report March 2000. Coordination completed under Section 7 of the Endangered Species Act, Fish and Wildlife Coordination Act, and other mandated acts were also included in the report. Responses that were received to the March 2000 report provided helpful input and information relevant to aspects of this report.

1.5.2 JANUARY 1995, SECTION 1135, ENVIRONMENTAL RESTORATION REPORT, MUNYON ISLAND, PALM BEACH COUNTY, FLORIDA

The Jacksonville District Corps prepared an Environmental Assessment on the proposed environmental restoration project. In association with the 1995 Environmental Assessment, environmental coordination was completed under Section 7 of the Endangered Species Act, Fish and Wildlife Coordination Act and other mandatory acts. Responses received to this coordination provided helpful information relevant to aspects this report.

1.5.3 DECEMBER 1999, MARINE SEAGRASS SURVEY OF THE ATLANTIC INTRACOASTAL WATERWAY, PALM BEACH COUNTY, FLORIDA.

The Jacksonville District Corps contracted the above survey and report to assess the impacts of dredging on marine seagrass habitat occurring in the Intracoastal Waterway (IWW), selected channels, and basins adjacent to the IWW in Lake Worth and Lake Worth Lagoon, Palm Beach County. The provided report documents the absence, presence, abundance, density and frequency of marine seagrass in the area and vicinity of the IWW. Specifically, the report documents the direct loss and indirect impacts on marine seagrass resources such as *Halophila johnsonii* (Johnson's seagrass), *H. decipiens* (Paddle grass), *H. wrightii* (Cuban shoal grass), and *Syringodium filiforme* (Manatee grass). Information on the occurrence and distribution of *H. johnsonii*, a 1998 Federally listed threatened marine plant, in the vicinity of the federal channel was of paramount importance. Information from this report has been included as relevant to impacts associated with the action proposed on Peanut Island and Palm Beach Harbor.

1.5.4 SEPTEMBER 2000, SECTION 1135, ENVIRONMENTAL RESTORATION REPORT WITH EA, JOHNS ISLAND, PALM BEACH COUNTY, FLORIDA.

The Jacksonville District Corps in conjunction with the Palm Beach County and the Florida Inland Navigation District propose environmental restoration of Johns Island to include, removal of exotic vegetation, stockpiled dredged material, and planting of indigenous plant species. Coordination was completed under Section 7 of the Endangered Species Act, Fish and Wildlife Coordination Act and other mandated acts were also included in the report. Relevant information from this EA was helpful in the preparation of this report.

1.5.5 OCTOBER 1996, COAST OF FLORIDA EROSION AND STORM EFFECTS STUDY, REGION III, with FINAL EIS, PALM BEACH, BROWARD, and DADE COUNTIES

This report summarize beach erosion and storm damage problems on the Atlantic Ocean shoreline of the lower southeast coast of Florida, over 88 miles within Palm Beach, Broward and Dade counties. Results from planning, engineering, environmental, economic, and real estate studies were incorporated into the report that seeks to recommend effective management and support of the coastal region in a comprehensive manner.

1.5.6 SECTION 205, ENVIRONMENTAL IMPACT STATEMENT, CANAL 51 (C-51), PALM BEACH COUNTY, FLORIDA.

The project area is located in Palm Beach County and runs east /west from Water Conservation Area Number One (Loxahatchee National Wildlife Refuge) to West Palm Beach at Lake Worth. The authorized project would provide 30 years of flood protection to the urbanized eastern basin and 10 years of flood protection to the western basin. This modified plan would provide water quality treatment, a reduction of damaging freshwater discharges to Lake Worth and increased water supply for the Everglades and other users. Aspects of the report provide a basis for certain information in this report as related to impacts on essential fishery habitat. Aspects of the EA as related to the elimination of a source of freshwater into the Lake Worth ecosystem and its beneficial effect on the establishment and proliferation of marine seagrasses were also incorporated into this report.

1.5.7 EARLIER NEPA DOCUMENTS.

Earlier NEPA documents and environmental reports have been completed (for this area) over the last decade. These reports are too numerous to list in this document, but to some degree are listed in the reports cited above and included by summary in this analysis where appropriate.

1.6 DECISION TO BE MADE.

Originally created in 1918 from dredged material disposal, Peanut Island has subsequently been expanded to 79 acres from the continual placement of dredged material. The island's ownership is shared by the Port of Palm Beach, Florida Inland Navigation District, Palm Beach County, and the United States Coast Guard.

The Port of Palm Beach (local sponsor) is responsible for providing a disposal site with capacity to store dredged material during maintenance dredging of Palm Beach Harbor. Dredged material storage capacity has been fully utilized with the existing stockpiled material. To provide the necessary material storage capacity, the local sponsor seeks to offload material from their dredged material storage area (DMSA) on the southern end of Peanut Island (Figure 2).

Relieving this area of the existing stockpiled material would provide a cost-effective material disposal alternative during future harbor dredging operations.

This environmental assessment (EA) would evaluate the impacts proposed to threaten and endangered species from the proposed change in maintenance operations at Palm Beach Harbor and Peanut Island. Additionally, the EA would evaluate (1) the anticipated adverse impacts and beneficial values to be received from the proposed removal of exotic plants and planting of indigenous upland and wetland plant species, and (2) aesthetics benefits to be received from reconfiguring and lowering the existing DMSA containment berm from 36 feet to 32 feet above mean low water.

The EA would also evaluated and recommend the disposal option for 600,000 cubic yards of material with the least adverse environmental impacts, in addition to, being the least cost disposal alternative. Disposal alternatives under consideration include: (1) nearshore disposal south of the southern jetty contiguous to Lake Worth Inlet (Figure 4), (2) nearshore disposal at Midtown beach (Figure 5), and (3) disposal over 99-acres adjacent to the shoreline of the City of Lake Worth Municipal Golf Course and the IWW (Figure 6).

1.7 SCOPING AND REVELANT ISSUES.

1.7.1 ISSUES EVALUATED IN DETAIL.

Issues identified relevant for detailed evaluation were identified either during scoping, coordination, or by the preparers of the Environmental Assessment (see Appendix C – Pertinent Correspondence). The issues are as following:

a. Sea Turtles. The proposed change in operations at Palm Beach Harbor project is located within the nesting ranges of the threatened loggerhead sea turtle (*Caretta caretta*), the endangered green sea turtle (*Chelonia mydas*), the leatherback sea turtle (*Dermachelys coriacea*), and the hawksbill sea turtle (*Eretmochelys imbricata*). Safeguards that are routinely employed in Corps Civil Works projects to prevent adverse impacts to the listed species would be part of the project's construction plans and specifications. These measures would include a turtle observer onboard each work vessel to alert the vessel's captain/operator to the presence of sea turtles and to ensure a shut down of operations until the sea turtles leave the work area. (see Appendix C – Pertinent Correspondence, Excerpts of Manatee/Sea Turtle Protection Guidelines). Further, the project proposes no detonation of explosives in or near water. The Corps is confidence these procedures would protect the continued survival of the species and believes the project is not likely to adversely affect any endangered or threatened sea turtles.

b. West Indian manatee. The proposed change of maintenance operations in Palm Beach Harbor is located within the year-round range of the West Indian manatee (*Trichechus manatus*). Lake Worth and Lake Worth Lagoon are designated critical habitat for the manatee (50 CFR 17.95). No adverse impacts are proposed to the manatee or their critical habitat from explosive detonation or hopper dredging. The standard Corps Manatee Protection Guidelines would be included in the proposed plans and specifications. The contractor would be informed of measures to implement that ensure manatees within 100 feet of the construction area are avoided and not harmed by the project. The project's plans and specifications would include an onsite observer with ability to stop operations, if a manatee is observed within 50 of construction. Implementation of these protective measures would ensure the proposed action is not likely to adversely affect the continued survival of the manatee or adversely alter its critical habitat. (see Appendix C – Pertinent Correspondence, Excerpts of Manatee/Sea Turtle Protection Guidelines).

c. Marine Seagrass. The Corps contracted with Lotspeich and Associates, Inc. (1998), and Dial Cordy Associates, Inc. (2001), to survey marine seagrass over a three year period (from 1998 to 2001), In an effort to assess potential impacts dredging operations would have on marine seagrass in Palm Beach County, specifically the IWW within the vicinity of Palm Beach Harbor. Of particular concern was the NMFS listed threatened species *Halophila Johnsonii* (Johnson seagrass). The Florida Department of Environmental Protection (DEP) and others have also documented the occurrence and extent of seagrass from Jupiter Inlet and Hobe Sound to Lake Worth Inlet and Lagoon. Earlier surveys for submerged aquatic vegetation (Lotspeich and Associates, Inc., 1998), documented the presence of four species of seagrasses, *Halodule wrightii* (Cuban shoal grass), *Syringodium filiforme* (Manatee grass), *Thalassia testudinum* (Turtle grass), and *H. englemannii* (Star grass). This report recommended that further surveys be conducted during peak growing season to determine the presence of Johnson seagrass since substantial seagrass communities exist within the IWW and vicinity. It was also noted that Palm Beach Harbor falls within the range of the threatened species. A seagrass survey report (Dial Cordy and Associates 2001) looked at potential direct and indirect

impacts to marine seagrasses within the IWW, selected channels, and boat basins north of the Port of Palm Beach to the Palm Beach Marina south of Peanut Island. This report documents the presence of the above marine seagrass species and two additional species (i.e., *H. decipiens*, Paddle grass and *H. Johnsonii*, Johnson seagrass).

Palm Beach County Department of Environmental Resources Management (DERM) extensively mapped submerged natural resources (1999) that occur in the natural shoal areas of Lake Worth, beginning at John D MacArthur State Recreational Park (north of Peanut Island) to the Ocean Avenue Bridge (south of Peanut Island). Palm Beach DERM resources mapping also included areas of macro algal species and corals. Two small areas of submerged resources (i.e., corals and sponges) lie east of Peanut Island within the access channel of the Lake Worth Inlet. The nearest coral-sponge resources to Peanut Island lies less than 1,000 feet from the shore with the furthest point located about 2,000 feet from the shore.

Dredging of Palm Beach Harbor has the potential to impact seagrass beds established within the channel and immediate vicinity. These impacts do not proposed any threat to *H. johnsonii* within vicinity of the channel at Peanut Island. The construction methods associated with offloading material from Peanut Island do not propose any seagrass impacts.

d. Cultural Resources. Peanut Island contains two previously recorded historical sites. Any potential Impacts to these resources were fully evaluated in the environmental assesement (EA) for Peanut Island, Section 1135, Environmental Restoration, March 2000. The Corps' archeologist and the Florida Department of State, Division of Historical Resources (DHR) determined the project would have no effect on historic property. Additionally, disposal of material adjacent to the City of Lake Worth Municipal Golf Course (LWMGC) proposes no impacts to any sites or property eligible for listing in the *National Register of Historic Places*. A no effect letter was received from the State DHR dated August 18, 2000 (see Appendix C – Pertinent Correspondence). Disposal options that propose placement of sand south of the Lake Worth Inlet southern jetty and on the shoreline of Midtown Beach propose no adverse historic or cultural resources impacts. These sites have been used in the past and disposal would be within existing footprints.

1.7.2 IMPACT MEASUREMENT.

Impacts to seagrass are based on direct impacts (i.e., area filled and area excavated) and indirect impacts (i.e., turbidity and any changes in substrate type or stability). Benefits to seagrass with filling the proposed anoxic dredged hole are dependent on water depth, clarity and substrate, sedimentation rates, salinity, currents wave energy, and tidal flushing. The following provides the means and rationale for measurement and comparison of impacts and benefits of the proposed action and alternatives. In areas where endangered or threatened species are known to occur, Corps projects are designed to avoid potential impacts to the fullest extent practicable. Further efforts are taken to avoid and minimize Impacts by ensuring the project's plans and specifications include measures which protect the continue survival of the species and prevent the unnecessary alteration of the species critical habitat. (see Appendix C – Pertinent Correspondence, Excerpts of Corps Manatee and Sea Turtle Protection Guidelines).

1.7.3 ISSUES ELIMINATED FROM DETAIL ANALYSIS.

The following issues were not considered important or relevant to the proposed action based on scoping and the professional judgment of the preparers of this Environmental Assessment.

a. Sand and rock separation. The separation of rock from sand on the island with the least cost alternative disposal option is not required. Sand stockpiled on the Port of Palm Beach DMSA contains only beach quality sand and is free of unacceptable rock size and quantities,

b. Beach Placement. The placement of beach quality material at the proposed alternative disposal options have been specifically addressed in the National Environmental Protection Act (NEPA) documents that evaluate local shore protection project for restoration of beaches from the Martin County line to the Jupiter Inlet to Lake Worth Inlet and the Boca Raton Inlet. Impacts associated with beach placement of dredged material have been addressed in EAs and Environmental Impact Statements specific to the area of impact within Palm Beach County.

c. Effects to Migratory Birds. The project helps facilitate environmental restoration efforts proposed for Peanut Island. No adverse impacts are anticipated, only environmental benefits. It's anticipated that at least 118 species of birds, including migratory, wading, and shore birds would be provided with suitable habitat.

d. Effects to mangroves. Existing mangrove habitat (3.0 acres) would receive increased flow due to removal of existing impoundments. Wetland expansion is proposed during the environmental restoration of Peanut Island as proposed under Section 1135, Environmental Restoration of Peanut Island.

1.8 PERMITS, LICENSES AND ENTITLEMENTS.

Water quality certification for the offloading of material from the southern terminus of Peanut Island is needed from the Florida Department of Environmental Protection (DEP). Certification would be obtained prior to the construction phase of the project. The Corps must also maintain consistency with the State's Coastal Zone Management Plan (CZMP). All efforts are employed by the Corps to ensure CZMP consistency to the maximum extent practicable.

State water quality certification for disposal proposed adjacent the LWMGC has been received under the permits issued to Palm Beach County. (see Appendix E – Other Actions on Peanut Island). Disposal at either of the two remaining options would require 1`Work previously performed on Peanut Island and past and current authorizations can be found in Appendix E – Other Actions on Peanut Island.

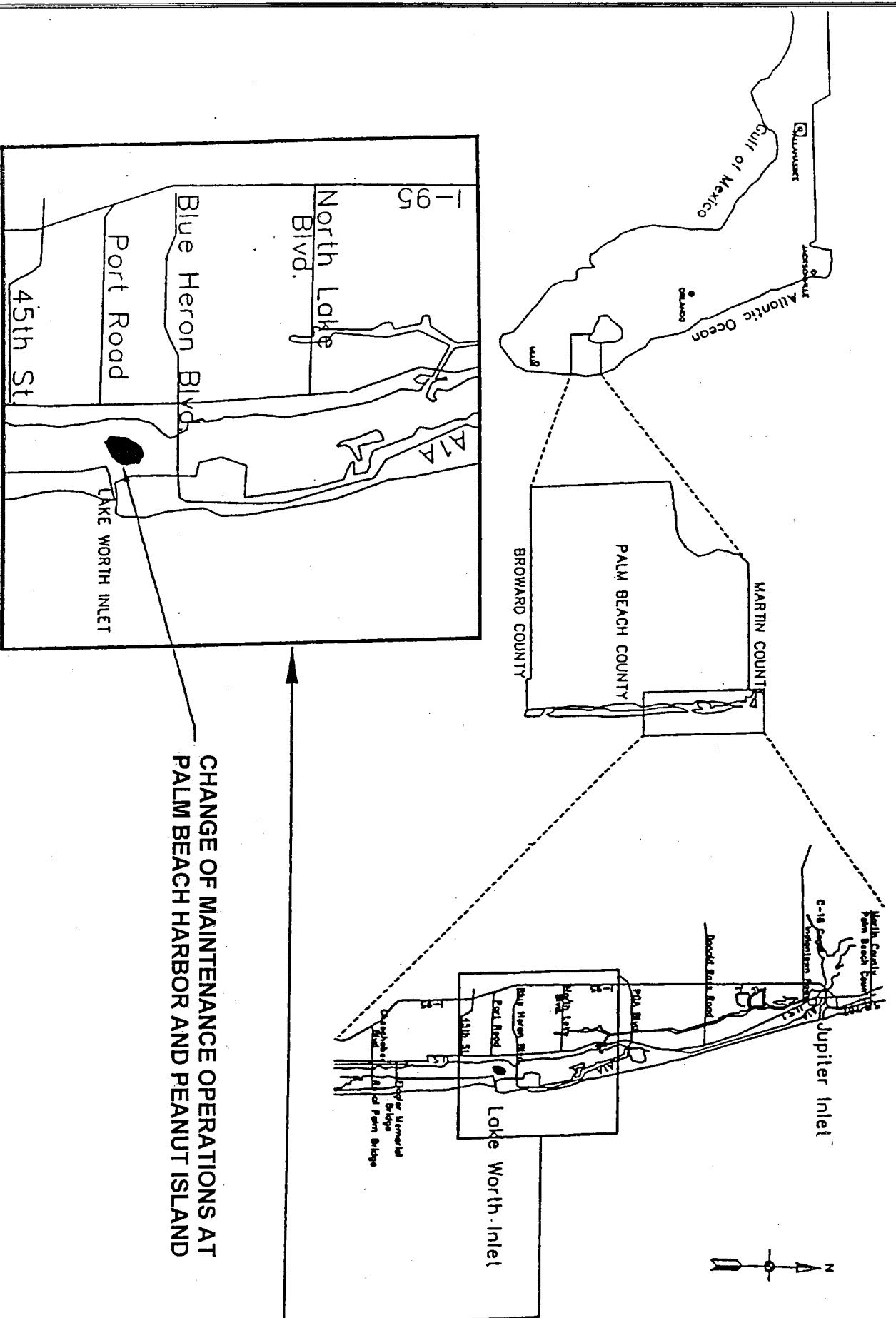
2.0 ALTERNATIVES.

2.1 INTRODUCTION.

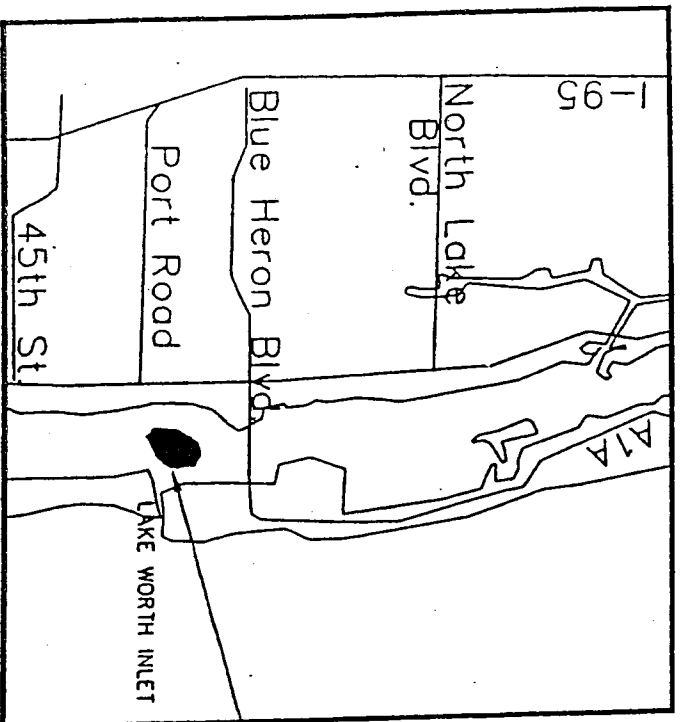
This section offers a detail evaluation of the project alternatives' direct, indirect, cumulative, and secondary impacts upon existing resources. The information with analysis is presented in the sections under the Affected Environment. In the Probable Impacts section, the beneficial and adverse environmental effect of the alternatives are presented in comparative form to enable a clear and concise understanding of the options by the decision makers and the public.

FIGURE 1. PROJECT LOCATION MAP

FIGURE 1



CHANGE OF MAINTENANCE OPERATIONS AT
PALM BEACH HARBOR AND PEANUT ISLAND



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JACKSONVILLE DISTRICT
U.S. ARMY CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

PEANUT ISLAND
LOCATION MAP

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CHANGE OF MAINTENANCE
OPERATIONS AT PALM BEACH
HARBOR AND PEANUT ISLAND

FIGURE 2. PALM BEACH HARBOR DREDGED MATERIAL STORAGE AREA MAP

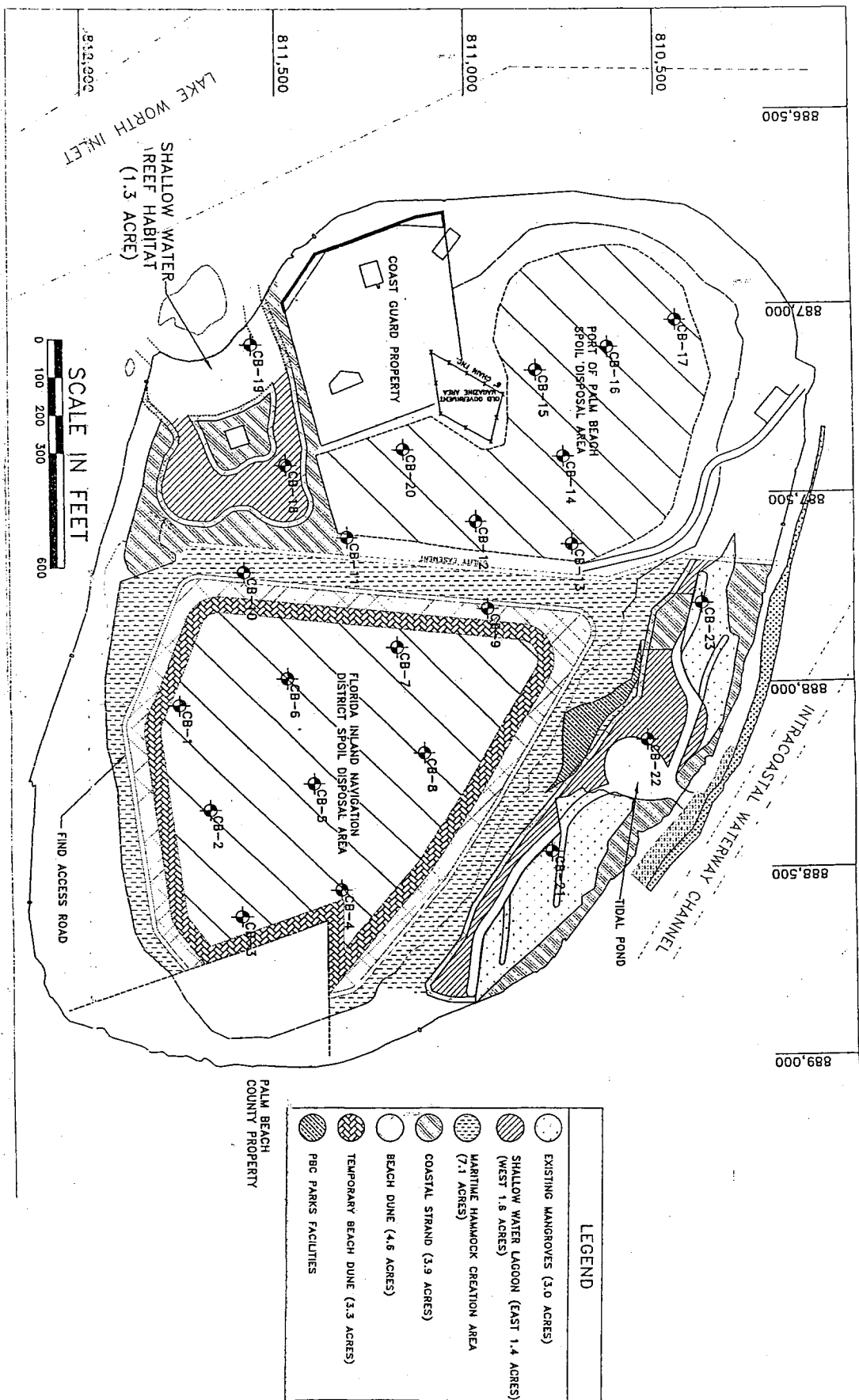


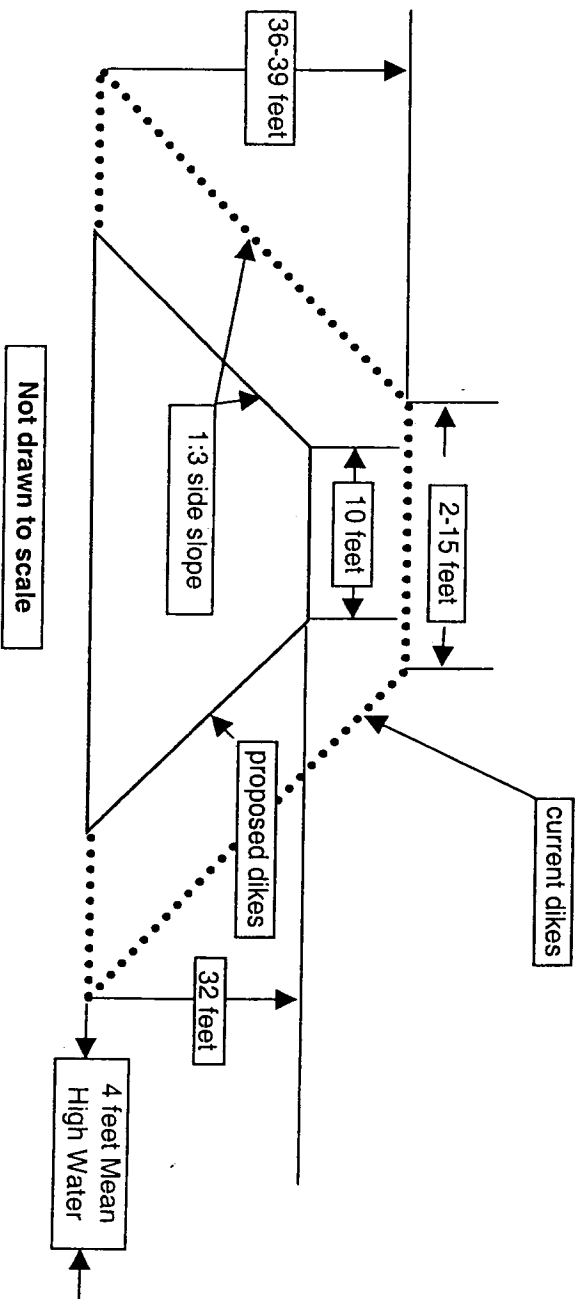
FIGURE 2

DEPARTMENT OF THE ARMY
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JACKSONVILLE, FLORIDA

PORT OF
PALM BEACH

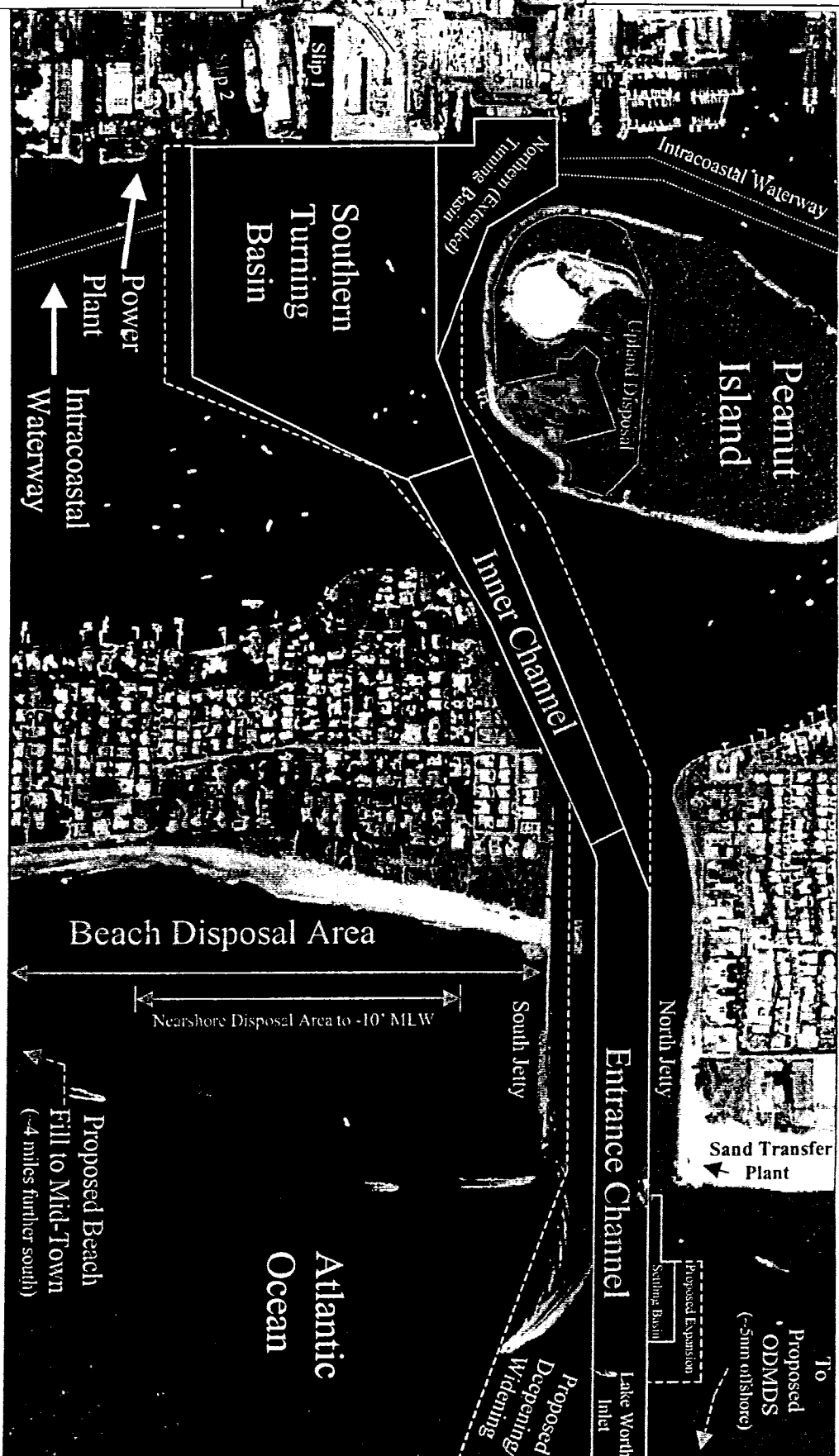
CHANGE OF
MAINTENANCE OPERATIONS AT
PALM BEACH HARBOR AND
PEANUT ISLAND

FIGURE 3. PORT OF PALM BEACH DIKE REHABILITATION CROSS SECTION



Palm Beach Harbor,
Peanut Island, Palm Beach
County, Florida
Current and Proposed
Dike Cross Sections
Jacksonville District
Corps of Engineers

FIGURE 4. LAKE WORTH INLET SOUTH JETTY DISPOSAL ALTERNATIVE LOCATION MAP

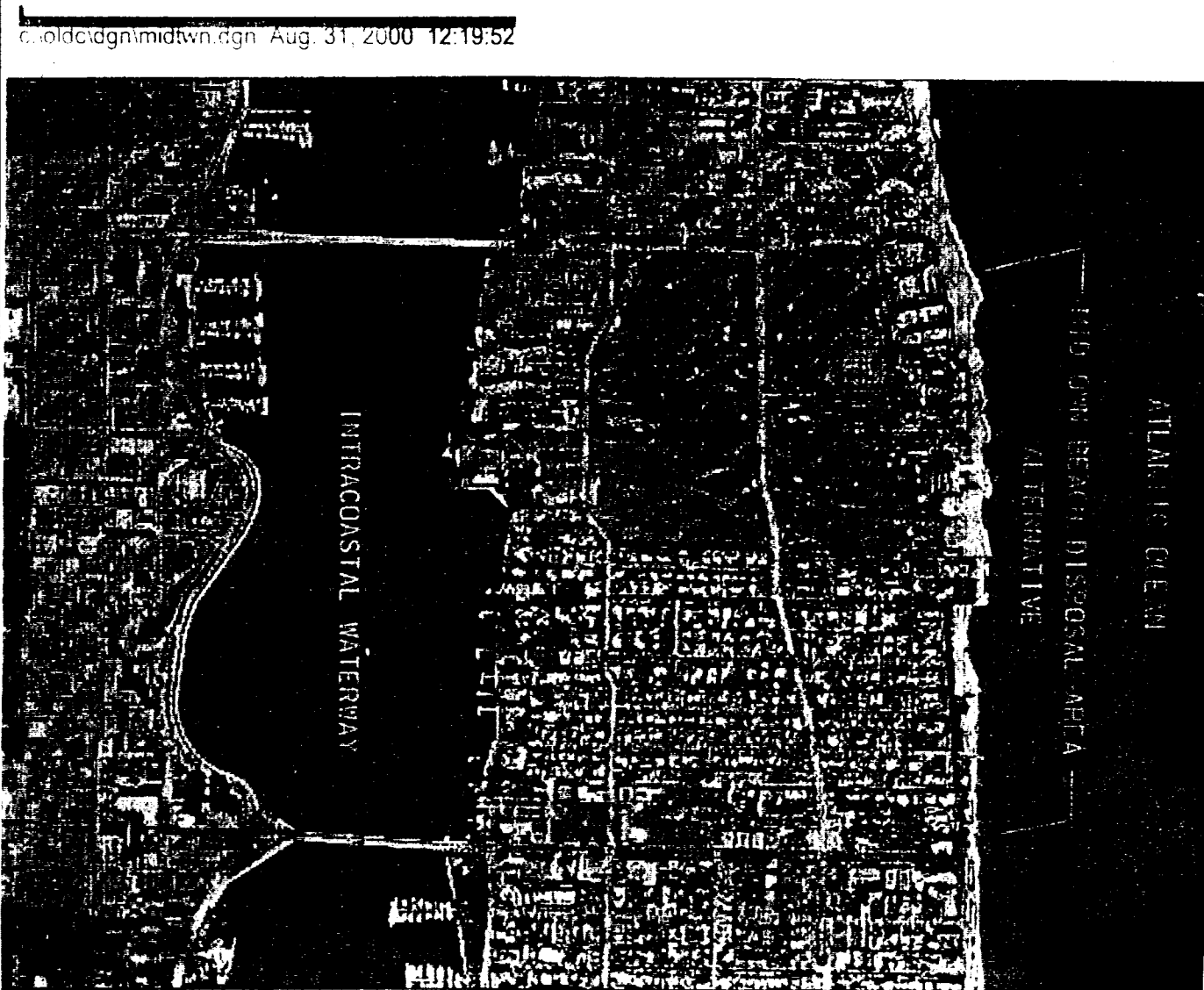


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JACKSONVILLE, FLORIDA

LAKE WORTH INLET
SOUTH JETTY
DISPOSAL ALTERNATIVE

CHANGE OF MAINTENANCE
OPERATIONS AT PALM BEACH
HARBOR AND PEANUT ISLAND

FIGURE 5. MIDTOWN BEACH DISPOSAL ALTERNATIVE LOCATION MAP



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MIDTOWN BEACH
DISPOSAL SITE
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CHANGE OF MAINTENANCE
OPERATIONS AT PALM BEACH
HARBOR AND PEANUT ISLAND

**FIGURE 6. ANOXIC HOLE DISPOSAL IN LAKE WORTH ALTERNATIVE LOCATION MAP
(LEAST COST DISPOSAL ALTERNATIVE)**

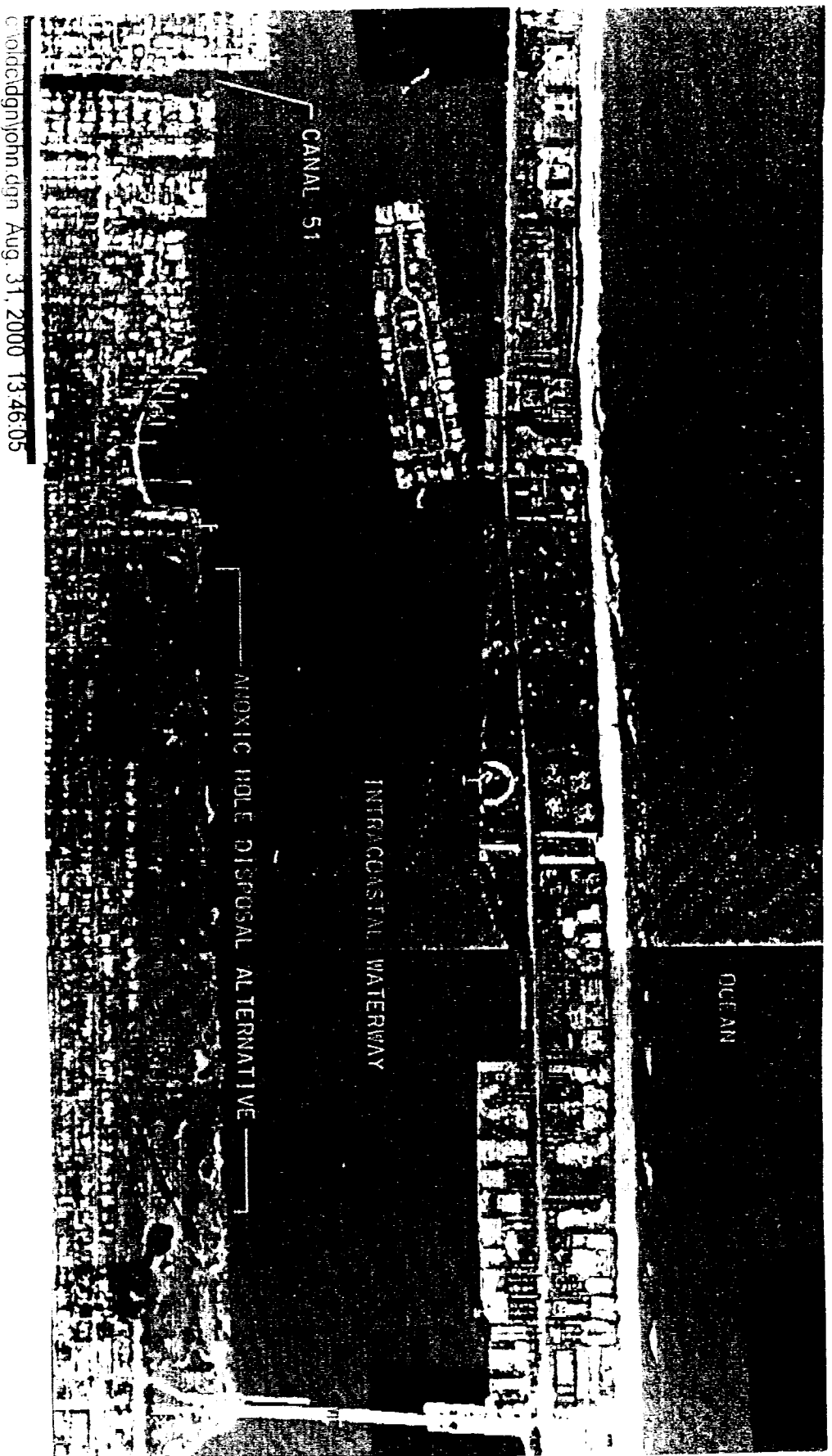
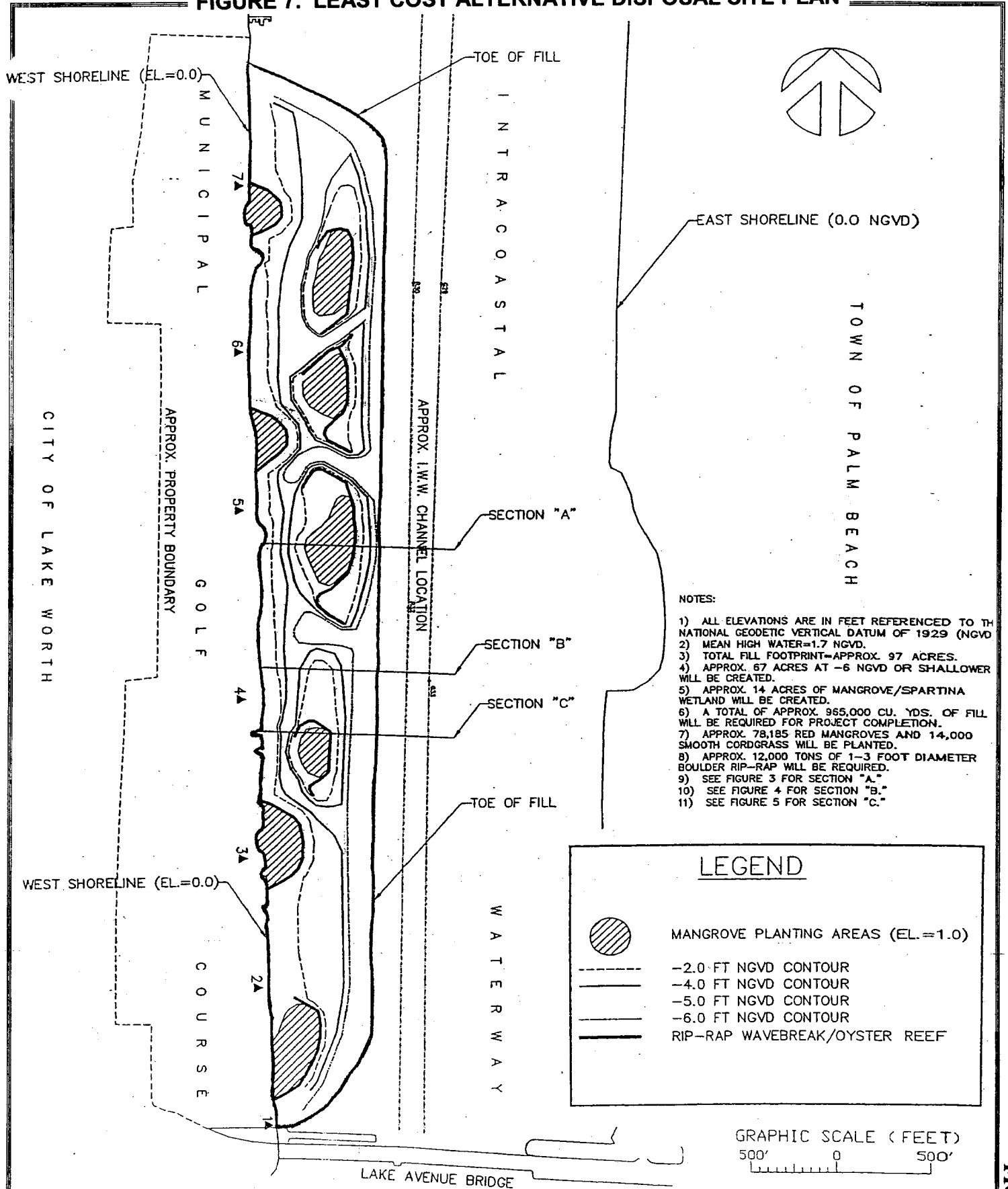


FIGURE 7. LEAST COST ALTERNATIVE DISPOSAL SITE PLAN



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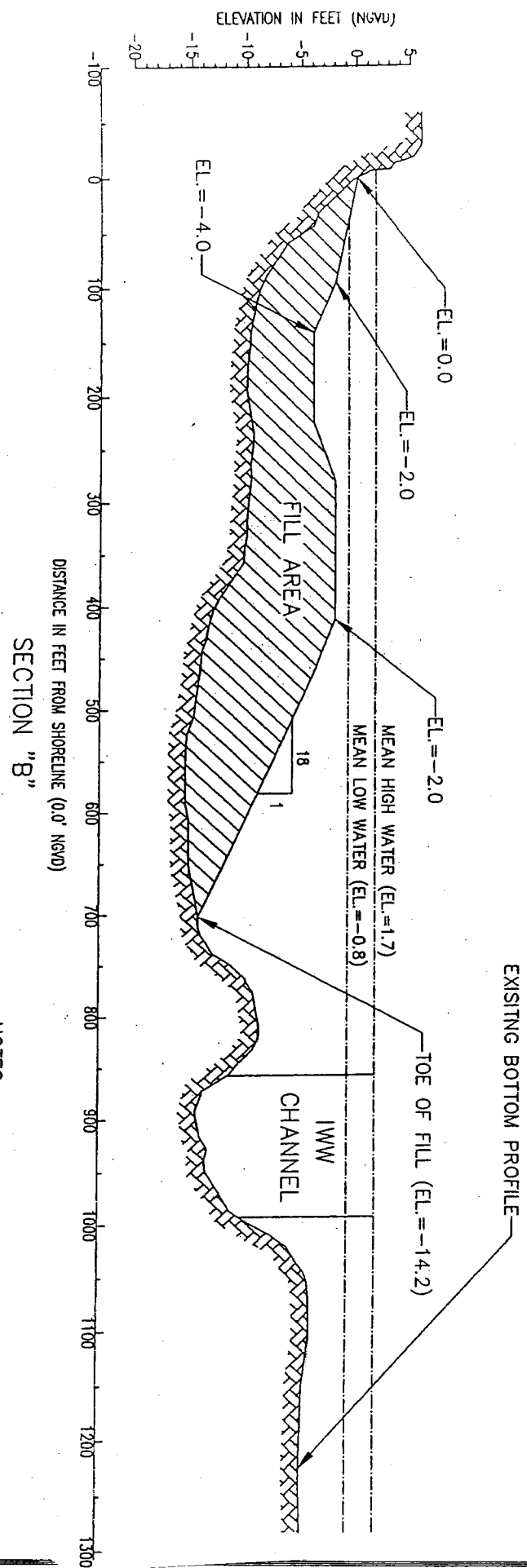
**LEAST COST ALTERNATIVE
DISPOSAL SITE MAP**

14

**CHANGE OF MAINTENANCE
OPERATIONS AT PALM BEACH
HARBOR AND PEANUT ISLAND**

FIGURE 7

FIGURE 8. LEAST COST DISPOSAL ALTERNATIVE CROSS SECTION



SECTION "B"

NOTES:

- 1) ALL ELEVATIONS ARE IN FEET REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD).

2.2 DESCRIPTION OF THE PROPOSED ACTION.

Alternatives were formulated for the change in maintenance operations at Palm Beach Harbor and Peanut Island disposal area, Palm Beach County, Florida. Formulated alternatives include (1) changing winter hopper maintenance dredging to summer pipeline maintenance dredging, (2) offloading existing dredged material from the Palm Beach Harbor DMSA (dredged material storage area) on Peanut Island, (3) rehabilitating the Palm Beach Harbor DMSA dikes to 32 feet MLW with grassing of the slopes to stabilize, and (4) disposing of the offloaded material in one of three proposed disposal locations.

Approximately 600,000 cubic yards of stockpiled material is proposed for removal by pipeline dredge from the southern end of Peanut Island. Disposal options available with the capacity to receive the anticipated dredged volume include (1) the nearshore area south of the south jetty at the Lake Worth Inlet, (2) the Midtown Beach disposal site (Palm Beach, County), or (3) a 99-acre borrow site (anoxic hole) located adjacent to the shoreline of the LWMGC and east of the IWW channel (Figure 6, 7 & 8).

2.3 DESCRIPTION OF ALTERNATIVES.

2.3.1 NO ACTION ALTERNATIVE (STATUS QUO)

A no action alternative would preclude cost effectiveness in achieving the project's goals and objectives. A winter dredging schedule would be maintained which increases concerns for equipment and personnel from inclement weather, winds, and tidal actions. A vital portion of the environmental restoration proposed for Peanut Island under Section 1135, of the Water Resource Act of 1986, as amended, would not be performed. Less potential for adverse impact to the West Indian manatee (*Trichechus manatus*), a federally listed endangered species would occur during the summer months. Lake Worth and Lake Worth lagoon are critical habitat areas for the manatee, which confines itself to coastal waters or waterways with warm discharge during winter months. A no action alternative also prevents the offloading of stockpiled dredged material from the Port of Palm Beach DMSA. About 600,000 cubic yards of stockpiled material would remain, creating the need to transport material from the project area. Plans to use the existing beach quality sand to either nourish eroding shorelines or to create seagrass habitat (by raising-to-grade existing borrow areas) would be precluded.

2.3.2 DREDGED MATERIAL PLACEMENT AT THE NEARSHORE DISPOSAL SITE SOUTH OF THE SOUTH JETTY AT LAKE WORTH INLET.

The dredged material placement option closest to Peanut Island is south of the south jetty at Lake Worth Inlet. At this site, dredged material disposal would be completed by pipeline routed along the southern side of the Lake Worth Inlet Channel. The pipeline would deposit the dredged material on the beach area south of the south jetty. This location would accommodate the estimated 600,000 cubic yards of dredged material. Dry-loading the stockpiled material on a barge and transporting to this disposal site is another disposal option. This disposal area has been used in the past and helps to keep dredged material on the beach and within the littoral drift process (see Figure 4). Disposal would be within the existing template and/or footprint of previous authorizations. This alternative would possibly require precautions to avoid impacts to nesting sea turtles.

2.3.3 DREDGED MATERIAL PLACEMENT AT THE MIDTOWN BEACH DISPOSAL SITE.

This dredged placement alternative has been used in the past and would accommodate the estimated 600,000 cubic yards of material to be offloaded from the Port of Palm Beach DMSA on Peanut Island. The Midtown Beach disposal site begins south of the Breakers Hotel and continues south for approximately two and a quarter miles. Disposal for this alternative would

be completed by pipeline routed along the IWW with an easterly bearing along the south property line of the Breakers Golf Course. Three bore and jackings on Palm Beach would be necessary for this alternative. This dredged material disposal alternative would place the material on the beach within the littoral drift and within the existing authorized template or footprint (Figure 5). This alternative would also require precautions to avoid impacts to nesting sea turtles.

2.3.4 DREDGED MATERIAL PLACEMENT AT THE LAKE WORTH DISPOSAL AREA (LEAST COST ALTERNATIVE).

The stockpiled material would be dry offloaded from the Port of Palm Beach DMSA unto barges for transport to an anoxic hole (Figure 6), located adjacent to the City of Lake Worth Municipal Golf Course shoreline. Bearing southerly along the IWW, the material would be placed over 99 acres of anoxic hole or tidal marine borrow site. This alternative is the more cost effective dredged material disposal alternative. In that, the area could easily accommodate the 600,000 cubic yards of material. The bottom or benthic elevation of the area would be raised to a grade which support the recruitment of marine seagrass. This alternative would assist Palm Beach County and their co-partner the Town of Palm Beach in their endeavor to provide environmental restoration adjacent to the City of Lake Worth municipal golf course. (Figures 7 & 8).

2.4 COMPARISON OF ALTERNATIVES.

Table 1 lists alternatives considered and summarizes the major features and consequences of the proposed action and alternatives. For a more detailed discussion of impacts of alternative, see Section 4.0.

2.5 MITIGATION.

Offloading and disposal of material from Peanut Island should have no adverse impacts to emergent or submerged aquatic resources. The proposed action would employ "Best Management Practices" to ensure resources within the project's scope are avoided and protected to the fullest extent possible. Mitigation is not required to offset or compensate any adverse environment impacts. However, material disposal adjacent to the LWMGC has the potential to support the recruitment of approximately 57 acres of submerged aquatic vegetation.

3.0 AFFECTED ENVIRONMENT

The affected environment section succinctly describes the existing environmental resources of the areas that would be affected, if any of the alternatives were implemented. This section also describes only those environmental resources that are relevant to the decision to be made. The entire environmental conditions are not discussed. A more detailed analysis and evaluation has been performed in Section 1135, the Environmental Restoration of Peanut Island. Only environmental resources that would be directly affected by disposal alternatives, if the alternatives were implemented have been described. This section, in conjunction with the description of the "no-action" alternative forms the baseline conditions for determining the environmental impacts of the proposed action and reasonable alternatives.

3.1 GENERAL ENVIRONMENTAL SETTING

The proposed project area is located in United States Climatic Zone 10 (Tropical Climate). Palm Beach County and the Intracoastal Waterway (IWW) form the eastern boundary of the site with Lake Worth Lagoon forming the southern boundary. Lake Worth Lagoon is a State of Florida designated Class III waters (recreational waterbody) and critical habitat for the West Indian manatee.

3.1.1 CREATION OF PEANUT ISLAND.

Originally called Inlet Island, Peanut Island was created in 1918 by the deposition of dredged materials from the excavation of the Inlet between Lake Worth Lagoon and the Atlantic Ocean. The Corps records indicate that maintenance of the Lake Worth Inlet between 1929 and 1993 resulted in the placement of over 1.2 million cubic yards of dredged material on Peanut Island, forming a 79-acre island. Over 2.8 million cubic yards of dredged material at this time, was also deposited at sea (much of the Peanut Island placement was sand mixed with rock and/or finer sediments, and therefore, was not suitable for beach placement).

3.1.2 PORT OF PALM BEACH.

By 1923, the Port of Palm Beach acquired the island, then 47 acres in size. Since 1934, the Corps has maintained the Palm Beach Harbor Navigation Project, using Peanut Island as a placement site for material dredged from maintenance of the IWW. The Port of Palm Beach also uses the island for placement of dredged material during maintenance dredging of the port's slips (see Figure 2).

3.1.3. OWNERSHIP.

In 1984, Palm Beach County and the Port of Palm Beach entered into an agreement for maintenance of the island, provided, it remained a passive recreational area. The Port held complete ownership of the island until December 1991, when 40 acres at the extreme north end was sold to the Florida Inland Navigation District (FIND). Palm Beach County owns 3.6 acres also on the north end of Peanut Island. Palm Beach County in 1994, entered into lease agreements with the Port of Palm Beach and FIND for development of the island's perimeter for public use (Figure 2).

3.2 VEGETATION

3.2.1 PEANUT ISLAND.

Peanut Island is currently dominated by exotic plant species, primarily Australian pine (*Casuarina equisetifolia*) and Brazilian pepper (*Schinus terebinthifolius*), but retains an impounded mangrove habitat on the western side of the island. The results of a Peanut Island vegetative survey conducted for FIND as part of their Peanut Island DMSA (Dredged Material Storage Area) are listed in Figure 9. Peanut Island is a site that is scheduled to provide dredged material management capacity to service the maintenance requirements of Reach III of the IWW in Palm Beach County (IWW mile 274.60 to mile 291.72) and the port's slips. Thick pine litter in most locations of the DMSA has eliminated or reduced ground cover. Portions of the shoreline experience erosion due to energy from boat wakes, northeasterly winds, and the poor stabilizing capability of Australian pine. Pronounced escarpments of exposed sand and large fallen trees are prominent along the southeastern shoreline.

3.2.1.1 LAKE WORTH LAGOON.

Lake Worth Lagoon's shoreline is approximately 70 linear miles. Natural vegetation along the shoreline has been lost to alterations from dredging, filling, and bulkhead construction, (Dames and Moore, 1999 – see Figure 9). Between 1940 and 1975, an estimated 87% of shoreline mangroves were eliminated by shoreline development (Harris et. al., 1983). Vertical bulkheads comprise approximately 65% of the shoreline (see Figure 11).

3.2.2 SEAGRASS DISTRIBUTION.

Seagrass communities can be found throughout Lake Worth Lagoon (see Figure 12). The highest concentrations of seagrass communities are located in the northeast lagoon area and in the vicinities of the Lake Worth and South Lake Worth Inlets. In 1975, a resource inventory found only 161 acres of seagrass in the Lagoon. This was a 96% decrease from surveys done in 1940 (4,271 acres) (Harris et al. 1983). In a more recent survey, a total of 2,010 acres of

seagrass were inventoried (Dames & Moore, 1999), still a 42% decrease from the 1940 survey. In northeast Lake Worth Lagoon, extensive turtle grass and (*Thalassia testudinum*) shoal grass (*Halodule wrightii*) communities exist in the area east of the IWW between Palm Beach Isles and Big Munyon Island (Dames and Moore, 1999). In general, seagrass are most abundant and dense in the shallow areas and those areas that contain good water quality. The greatest abundance of manatee grass is located in the vicinity of Lake Worth Inlet. Areas north of Lake Worth Inlet contain significant communities of mixed *Halophila* and *Halodule*. Seagrass and macroalgal communities are very important habitat for many marine species.

3.2.3 SEAGRASS PRODUCTIVITY.

Seagrasses are the second most important primary habitats in estuaries, the most important of which (in South Florida) is turtlegrass (*Thalassia testudinum*). Heald and Odum (1969) noted in Waldner, 1989, that, in addition to mangroves, turtlegrass contributes significantly to the detrital food chain in estuaries. Seagrass and macro algal communities provide very important habitat for many marine species. Their continued survival and proliferation in Lake Worth Lagoon is dependent upon protection from direct impacts and maintenance of good water quality.

3.2.4 SEAGRASS RECRUITMENT.

Within the 20-acre wetland habitat created on nearby Munyon Island, Palm Beach County staff have recorded the presence of a number of seagrass and algal species growing within shallow areas of the tidal channels including *Halodule wrightii*, *Thalassia testudinum*, *Halophila johnsonii*, *Halophila decipiens*, *Caulerpa sertularioides*, and *Gracilaria tikvahiae*. *Halophila johnsonii* is a Federally listed threatened seagrass species under the Endangered Species Act (ESA) and is designated critical habitat.

3.2.5 MANGROVES.

An isolated mangrove strand currently exists on the west side of the island which consists of all three species of mangroves; red, (*Rhizophora mangle*); black, (*Avicennia germinans*); and white, (*Laguncularia racemosa*), as noted by Palm Beach County Department of Environmental Resources Management. The system is impounded by a sand berm that is traversed only at spring high tides, and is therefore, not functioning to capacity due this obstruction. Lack of flushing precludes the detritus export, an important food source and the basis of primary production, from entering the tidal system. The existing Impoundment also affects the nutrient removal and sediment trapping capabilities of the mangrove system.

3.3 THREATENED AND ENDANGERED SPECIES.

In accordance with Section 7 of the Endangered Species Act, the U.S. Fish and Wildlife Service was contacted for their input concerning Federally listed threatened (T) and endangered (E) species that are known to occur in the project area. The West Indian Manatee (*Trichechus manatus*) (E) and Sea Turtles [loggerhead sea turtle (*Caretta caretta* – T) green sea turtle (*Chelonia mydas* - E), leatherback sea turtle (*Dermochelys coriacea* -E), hawksbill sea turtle (*Eretmochelys imbricata* - E)] are also known to inhabit the project area.

The seagrass *Halophila johnsonii*, johnson's seagrass, has been listed by the National Marine Fisheries Service (NMFS) as a Federally threatened species due to its very limited range, threatened habitat destruction, and the fragile nature of the plant's shallow root system. *H. johnsonii* is recognized as a successional seagrass species whose water depth limitations are

TABLE 1: SUMMARY OF DIRECT AND INDIRECT IMPACTS

ALTERNATIVES ENVIRONMENTAL FACTORS	Change Palm Beach Harbor Winter Hopper Dredging to Summer Pipeline	Peanut Island Winter Offloading Event	Disposal on Beach, South of the South Jetty of Lake Worth Inlet	Disposal at Midtown Beach, Palm Beach, FL	Lake Worth Golf Course & IWW Disposal Dryload Barge & Dump in Hole – Least Cost Alternative	No Action – Status Quo
PROTECTED SPECIES	Manatee & Sea Turtle Concerns	Manatee Concerns	Manatee & Sea Turtle Concerns	Manatee & Sea Turtle Concerns	Manatee & Sea Turtle Concerns	No Impact
OTHER FISH AND WILDLIFE RESOURCES	No Adverse Effects Anticipated	No Adverse Effects Anticipated	No Adverse Effects Anticipated	No Adverse Effects Anticipated	Potential to create 57 ac. of Seagrass & 17.9 ac of other Aquatic Habitat	No Impact
VEGETATION	No Impacts Anticipated	Little if any Vegetation	Minor if any Impacts	Impacts are Likely	Benefits to with ±15 ac. of habitat creation	No Impact
WATER QUALITY	No Discharge into Wetlands or FL Waters	No Discharge into Wetlands or FL Waters	No Discharge into Wetlands or FL Waters	No Discharge into Wetlands or FL Waters	Improvements to by filling dredged hole & creating seagrass & wetland habitats	No Impact
HISTORIC PROPERTIES	No historic Properties or Setting Impacts	No historic Properties or Setting Impacts	No historic Properties or Setting Impacts	Potential Impacts to Historic Properties	No historic Properties or Setting Impacts	No Impact
RECREATION	Possible Temporary Impacts	Possible Temporary Impacts	Possible Temporary Impacts	Possible Temporary Impacts	Possible Temporary Impacts	No Impact
AESTHETICS	Possible Temporary Impacts	Possible Temporary Impacts	Possible Temporary Impacts	Possible Temporary Impacts	Possible Temporary Impacts	No Impact
ECONOMICS	May Have Positive Impact to Port	Could be More Costly than Summer	Closest Disposal Option	Mid Range Dist.-Boring & Jacking Req.	Farthest Away – Good Enviro. Benefits	No Impact
MIGRATORY BIRDS	No Impacts (April 1 – Sept 1) Anticipated	No Impacts (April 1 – Sept 1) Anticipated	No Impacts (April 1 – Sept 1) Anticipated	No Impacts (April 1 – Sept 1) Anticipated	No Impacts (April 1 – Sept 1) Anticipated	No Impact
ENERGY REQUIREMENTS AND CONSERVATION	Could Require Less Energy	Could Save Future Energy Costs With Closest Disposal Option	Closest Disposal Option for Pipeline Dredge Disposal	Mid Distance Disposal Option – Bore & Jackings Required	Could be Energy Efficient With Dryloading and Barging to Disposal Site	No Impact
HAZARDOUS, TOXIC, AND RADIOACTIVE WASTES	Harbor Dredging is not a Project Alternative	No HTRW Likely Based on Database Search & Site Visit	No HTRW Likely Based on Database Search & Site Visit	No HTRW Likely Based on Database Search & Site Visit	No HTRW Likely Based on Database Search & Site Visit	No Impact
NAVIGATION	No Impacts Anticipated	No Impacts Anticipated	Minor/Temp. Impacts during disposal	Minor/Temp. Impacts during disposal	Minor/Temp. Impacts during disposal	No Impact
HARDGROUNDS	No Impacts Anticipated	No Impacts Anticipated	Potential nearshore impacts	Potential nearshore impacts	Benefits with Creation of 2.8 ac. of oyster reef & Breakwater. Habitat	No Impact

LAKE WORTH LAGOON.

FIGURE 9. LAND USE AND VEGETATION ON PEANUT ISLAND

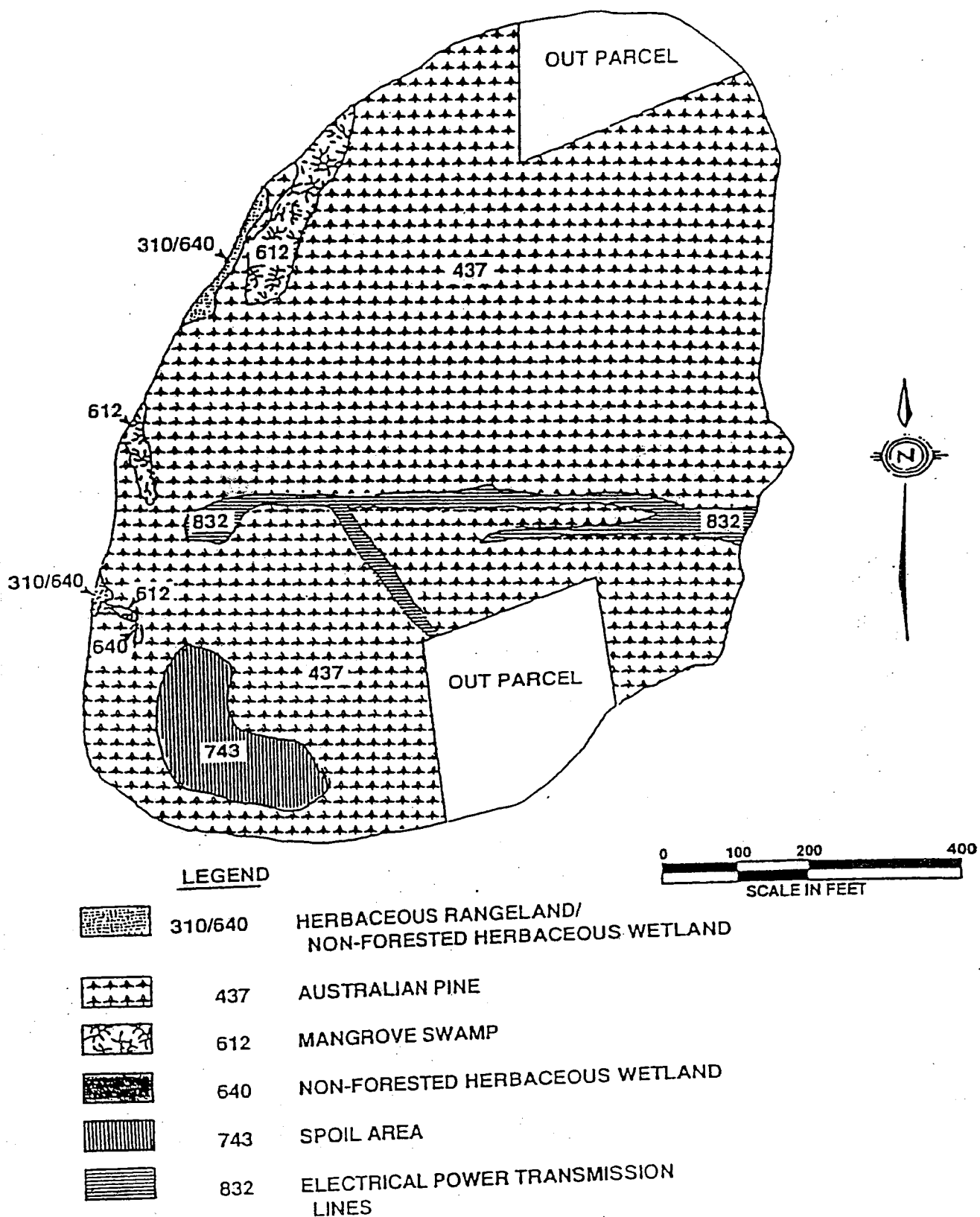


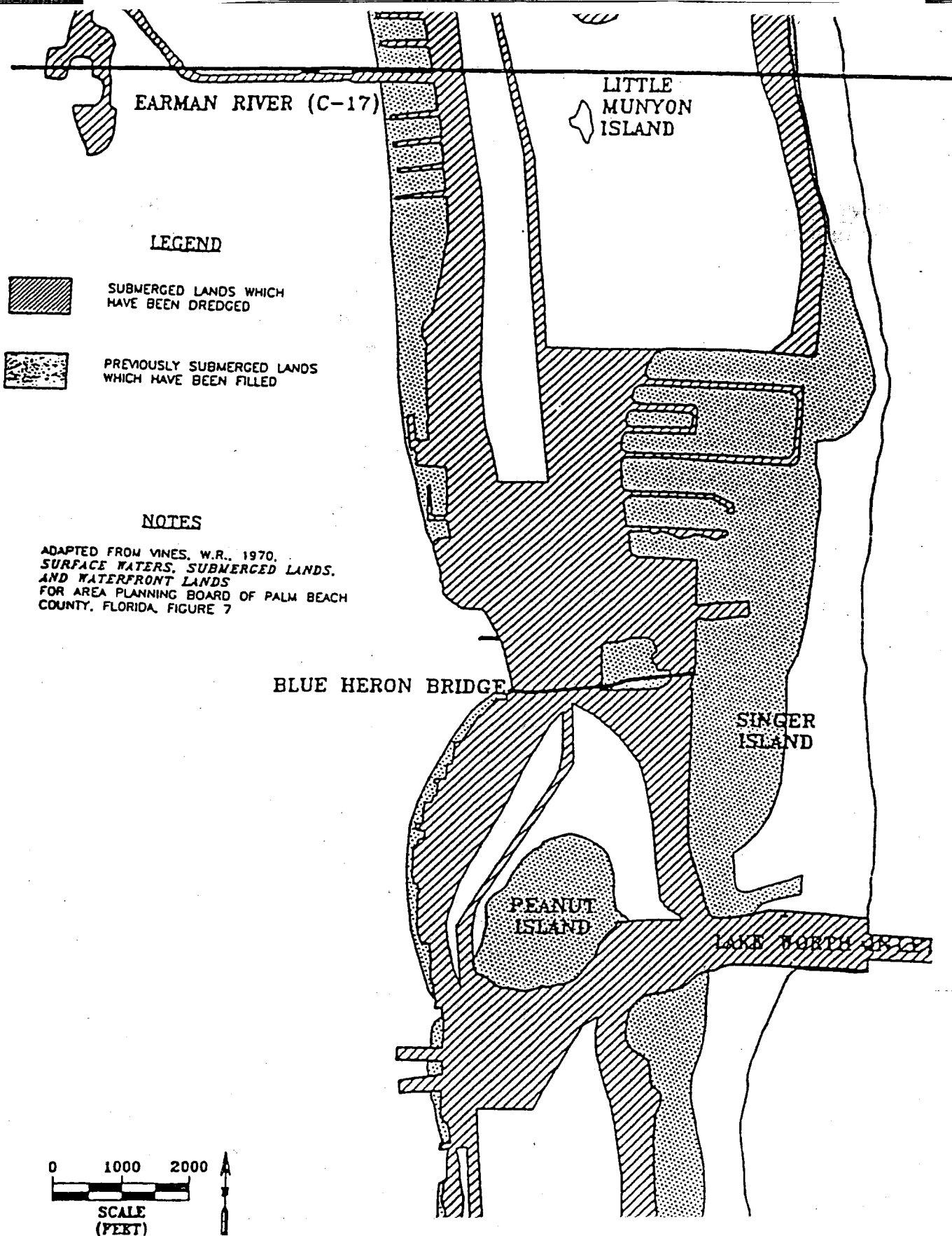
FIGURE 9

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT
U.S. ARMY CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

LAND USE AND VEGETATION
MAP OF PEANUT ISLAND

CHANGE OF MAINTENANCE
OPERATIONS AT PALM BEACH
HARBOR AND PEANUT ISLAND

FIGURE 10. DREDGED AND FILLED AREAS WITHIN THE PROJECT VICINITY

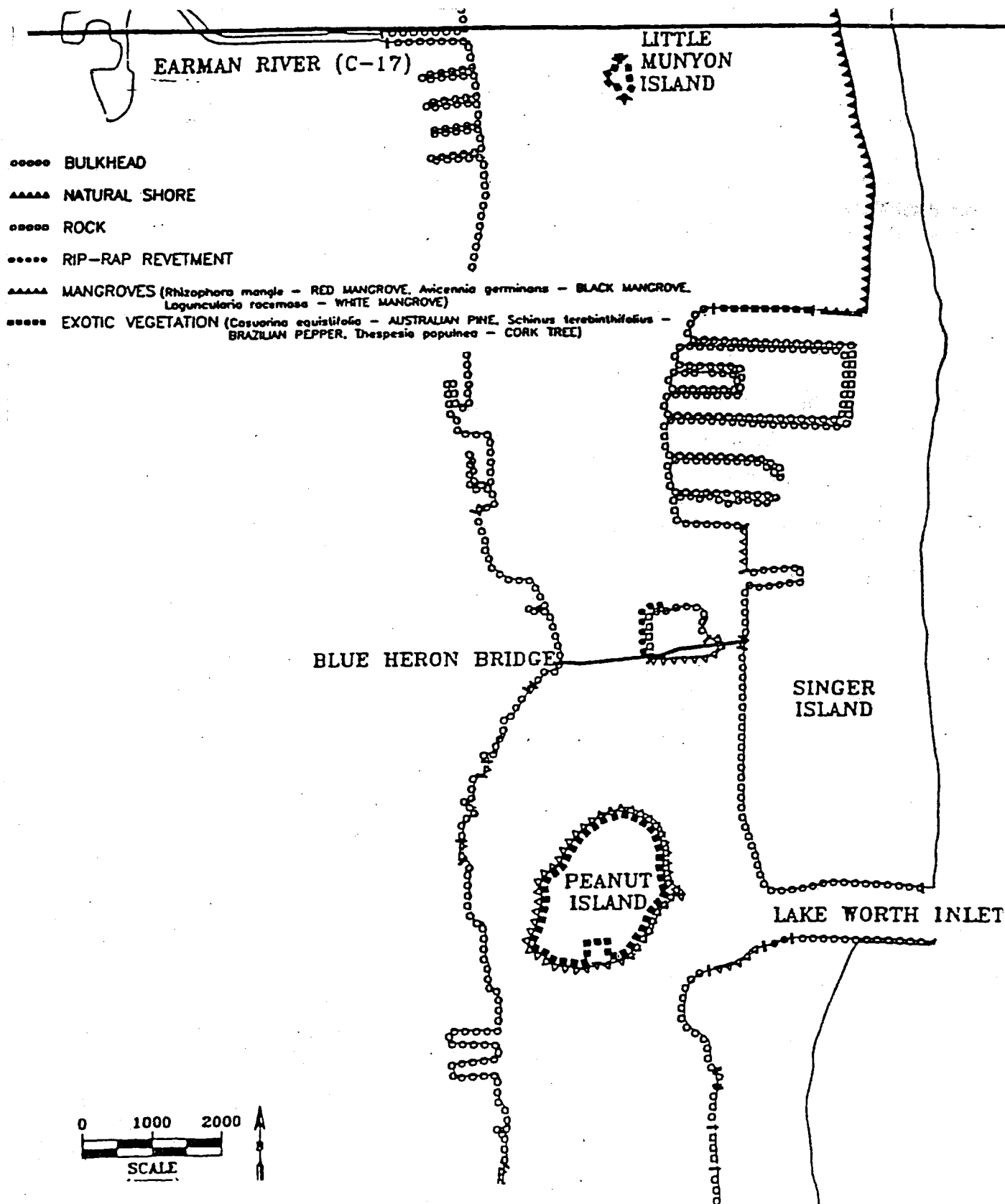


DEPARTMENT OF THE ARMY
 JACKSONVILLE DISTRICT
 U.S. ARMY CORPS OF ENGINEERS
 JACKSONVILLE, FLORIDA

**DREDGED AND FILLED AREAS
 WITHIN PROJECT AREA**

CHANGE OF MAINTENANCE
 OPERATIONS AT PALM BEACH
 HARBOR AND PEANUT ISLAND

FIGURE 11. SHORELINE CHARACTERISTICS WITHIN THE PROJECT VICINITY

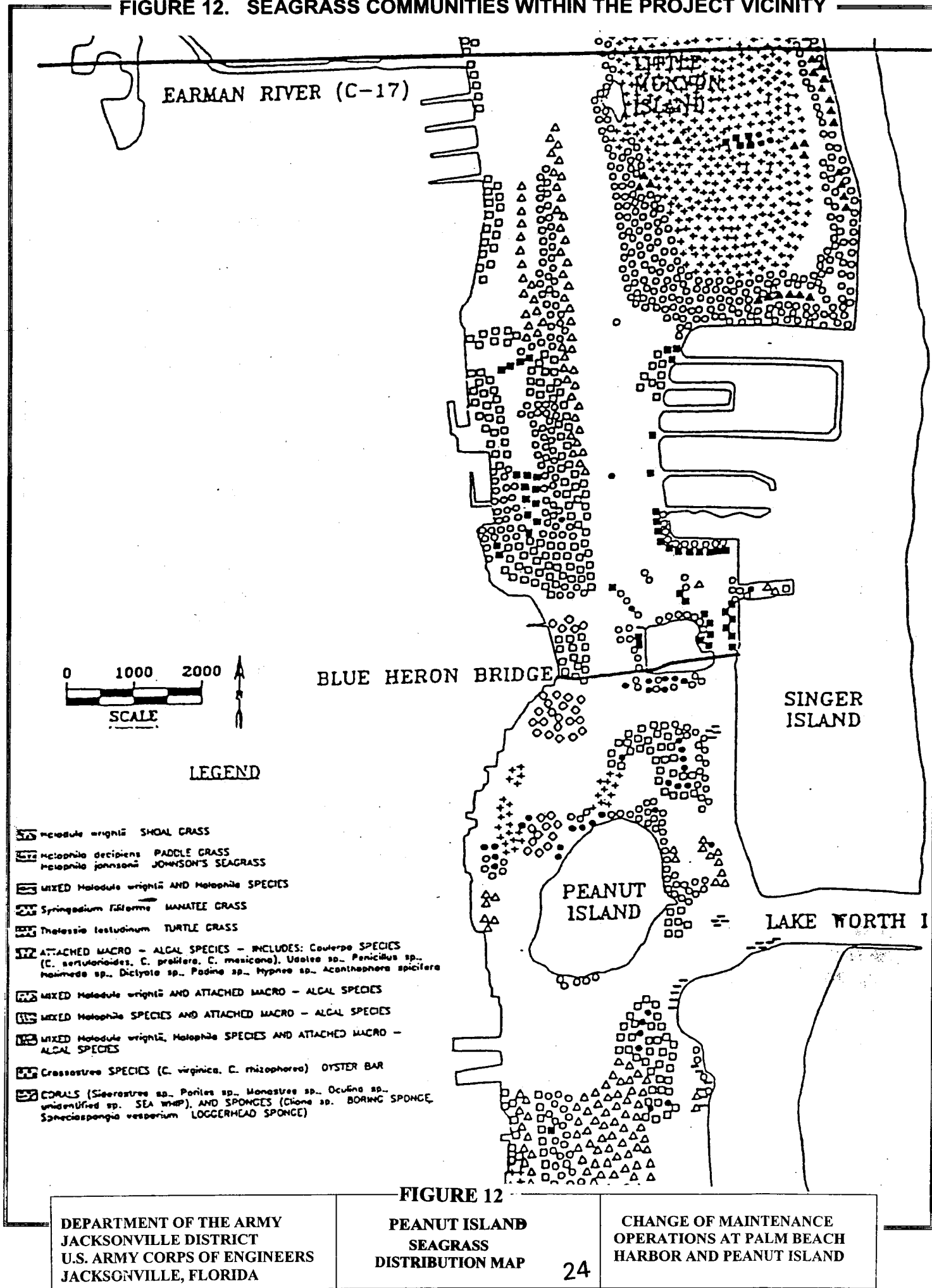


DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FIGURE 11
PORT OF
PALM BEACH

CHANGE OF
MAINTENANCE OPERATIONS AT
PALM BEACH HARBOR AND
PEANUT ISLAND

FIGURE 12. SEAGRASS COMMUNITIES WITHIN THE PROJECT VICINITY



approximately ten feet based on natural light penetration. Seagrass is abundant in Lake Worth Lagoon and does exist adjacent to Peanut Island. Dredged material disposal in this area has the potential to impact approximately 0.25 acre of Johnson seagrass and 0.58 acre of sparse to moderate seagrass impacted at the LWMGC. The proposed impacts would not be directly attributable to the proposed disposal, but seagrass impact in this area were coordinated under Section 7 of the Endangered Species Act with NMFS (National Marine Fisheries) with conservation recommendations for survival of the species.

3.4 FISH AND WILDLIFE RESOURCES

The U. S. Fish and Wildlife Service reported in their November 18, 1997 Coordination Act Report the presence of several Federally listed threatened and endangered species that are known to occur in the project vicinity (see Appendix C – Pertinent Correspondence). Additional species noted within the project area by the USFWS are included in Table 2A. In addition to the Federally protected species that could inhabit the project area, below is a list of State Species of Special Concern that have been observed in the Munyon Island Restoration Project area by State Biologists and County Environmental staff:

Table 2

STATE SPECIES OF CONCERN		
Wood Stork,	Peregrine Falcon	Least Tern
Little Blue Heron	Great Blue Heron	Reddish Egret
Snowy Egret	Brown Pelican	White Ibis,
Osprey	Gopher Tortoise	

3.4.1 BIRD SPECIES IN LAKE WORTH LAGOON.

Table 4 provides a list of birds observed in nearby John D. MacArthur Beach State Park. Munyon Island, within the Park, once supported such a large bird rookery that the Seminoles called the Island "Nuctsachoo", meaning "pelican" and early white settlers referred to it as Pelican Island (Duever et. al.,1981). The rookery was reportedly decimated by collecting activities and the name, literally, disappeared with the birds. More that 50 percent of the commonly observed bird species are linked to the aquatic environs and are expected to utilize the habitat provided by the restoration of Peanut Island. The proposed change in maintenance operations project will not adversely affect the proposed habitat creation on Peanut Island or the potential for additional rookery habitat.

3.5 FISH SPECIES IN LAKE WORTH LAGOON.

The *Lake Worth Lagoon Natural Resources Inventory and Resource Enhancement Study*, completed in 1999 by Dames and Moore for Palm Beach County, contains a list of 195 fish species that have been collected and identified in the Lake Worth Lagoon. The list was compiled from six studies conducted from 1962 to 1985, Table 3. A total 261 species of fish have been recorded from northern Lake Worth Lagoon to just south of the Lake Worth Inlet. These species are associated with a marine plant community composed of the seagrass *Halodule wrightii*, *Halophila spp.*, and *Thalassia testudinum*, and marine algae species such as *Caulerpa sertularioides*, *Acanthophora spicifera*, and *Dictyota bartayresii* (Herrema, et al.,1973).

3.6 COASTAL BARRIER RESOURCES.

The proposed Peanut Island change in maintenance operations project is not within a Coastal Barrier Resources (CBR) Unit or adjacent to any designated Coastal Barrier Resource Unit. The closest CBR Unit is FL-18P (John D. MacArthur Beach State Park), just over two miles to the north and east.

3.7 WATER QUALITY

Water quality data has been collected in Lake Worth Lagoon since the late 1960's. This data indicate the lagoon is a moderately polluted estuarine system. A trend analysis indicates water quality remained fairly constant or slightly improved over a fifteen-year period. Analysis of sediments for heavy metals and organic compounds indicate a system that chronically receives runoff from urban development (Dames and Moore, 1999). The hydraulic characteristics of Lake Worth Lagoon have been greatly altered from historic conditions by changes in tidal influence and fresh-water inflows. Peanut Island is located in the north-central Lake Worth Lagoon Estuary in designated Class III-Outstanding Florida Waters. The island's eastern border is the Lake Worth Inlet with the IWW and Palm Beach Harbor forming the western boundaries.

3.8 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE.

The proposed changes in maintenance operations at Palm Beach Harbor and Peanut Island project would include summer pipeline dredging instead of winter hopper dredging and offloading of the Palm Beach Harbor DMSA on the southern end of Peanut Island. A review of the HTRW database on June 2, 2000 indicated that no contamination exists on Peanut Island or the dredged material disposal site. The investigation was conducted in accordance with the Hazardous, Toxic or Radioactive Waste (HTRW) assessment requirements of ER 1165-2-123, HTRW Guidance For Civil Works Projects. A Phase I, Environmental Assessment For Peanut Island was prepared by Palm Beach County, Department of Environmental Resources Management, in November of 1997. The subject site was examined for "Recognized Environmental Conditions" in accordance with the American Society of Testing and Materials (ASTM) Standard 1527-94. The assessment revealed no evidence of recognized environmental conditions in connections with the subject parcel.

3.9 AIR QUALITY.

The existing air quality of the project site vicinity is typical of an urban area near the beach influenced by southerly trade winds. Air quality overall within the project area is good on most days with poor air quality the exception. At some times, air quality can appear to be lowered during the days that are very still and traffic congestion or fires from the everglades significantly influence air quality on a more regional basis.

3.10 NOISE

Airplane traffic overhead of the Peanut Island is the most noticeable sound within the project area. The area sustains some localized vehicular traffic and boat noise but not to any significant degree or amount. Ocean breezes rustling through the trees is a noticeable background sound.

3.11 AESTHETIC RESOURCES.

The surrounding proposed project aesthetics are typical of a tropical urban area with water frontage. In general, aesthetic resources within the project area are better to the east than the west as beachside development is residential and reflects human activity. Landscapes are well maintained with fairly lush tropical plant materials present in many viewsheds. Foreground project views to the west are of commercial development and not as scenic as the beachside panorama. Views of the immediate waters surrounding Peanut Island are considered aesthetically pleasing.

3.12 RECREATION RESOURCES.

The main recreational resource utilized within the project area is boating on the IWW and contiguous waters. Other ancillary recreation resources that occur while boating include fishing,

TABLE 3

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES
AND CANDIDATE SPECIES FOR FEDERAL LISTING
IN PALM BEACH COUNTY

Scientific Name	Common Name	Status
Amphibians and Reptiles		
<i>Alligator mississippiensis</i>	American alligator	T (S/A)
<i>Caretta caretta</i>	Loggerhead sea turtle	T
<i>Chelonia mydas</i>	Green sea turtle	E
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E
<i>Drymarchon corais couperi</i>	Eastern indigo snake	T
<i>Eretmochelys imbricata</i>	Hawksbill sea turtle	E
<i>Lepidochelys kempii</i>	Kemp's (=Atlantic) ridley sea turtle	E
Birds		
<i>Aphelocoma coerulescens</i>	Florida scrub-jay	T
<i>Campephilus principalis</i> (probably extinct in south Florida)	Ivory-billed woodpecker	E
<i>Charadrius melodus</i>	Piping plover	T
<i>Dendroica kirtlandii</i>	Kirtland's warbler	E
<i>Haliaeetus leucocephalus</i>	Bald eagle	T
<i>Mycteria americana</i>	Wood stork	E
<i>Picoides borealis</i>	Red-cockaded woodpecker	E
<i>Polyborus plancus audubonii</i>	Audubon's crested caracara	T
<i>Rostrhamus sociabilis plumbeus</i>	Everglade snail kite	E*
<i>Sterna dougalli dougalli</i>	Roseate tern	T
<i>Vermivora bachmanii</i>	Bachman's warbler	E
Mammals		
<i>Felis concolor</i>	Mountain lion	T (S/A)
<i>Felis concolor coryi</i>	Florida panther	E
<i>Trichechus manatus latirostris</i>	West Indian manatee	E*
<i>Ursus americanus floridanus</i>	Florida black bear	C
Plants		
Family Annonaceae		
<i>Asimina tetramera</i>	Four-petal pawpaw	E
Family Convolvulaceae		
<i>Jacquemontia reclinata</i>	Beach jacquemontia	E
Family Cucurbitaceae		
<i>Cucurbita okeechobeensis</i>	Okeechobee gourd	E

* Critical habitat has been designated for this species in this county.

TABLE 3

THREATENED AND ENDANGERED SPECIES

ENDANGERED SPECIES, THREATENED SPECIES, RARE SPECIES AND SPECIES OF
SPECIAL CONCERN THAT MIGHT BE FOUND IN AND AROUND LAKE WORTH
LAGOON, PALM BEACH COUNTY, FLORIDA

LATIN NAME	COMMON NAME	STATUS
<u>PLANTS</u>		
<i>Acrostichum aureum</i>	Golden Leather Fern	E
<i>Acrostichum danaeifolium</i>	Giant Leather Fern	T
<i>Cereus pentagonus</i>	Dildo Cactus	T
<i>Chrysophyllum oliviforme</i>	Satin Leaf	E
<i>Encyclia tampensis</i>	Butterfly Orchid	T
<i>Ophioglossum palmatum</i>	Hand Fern	E
<i>Opuntia humifusa</i>	Twistspine Prickly Pear	T
<i>Opuntia stricta</i>	Prickly Pear	T
<i>Phlebodium aureum</i>	Golden polypody	T
<i>Psilotum nudum</i>	Whisk Fern	T
<i>Tillandsia paucifolia</i>	Wild Pine	T
<i>Tillandsia valenzuelana</i>	Soft Leaf Wild Pine	T
<i>Vittaria lineata</i>	Shoestring Fern	T
<u>VERTEBRATES</u>		
<u>MAMMALS</u>		
<i>Trichechus manatus latirostris</i>	West Indian Manatee	E
<u>REPTILES</u>		
<i>Caretta caretta caretta</i>	Loggerhead Turtle	T
<i>Chelonia mydas mydas</i>	Green Turtle	E
<i>Gopherus polyphemus</i>	Gopher Tortoise	SSC
<i>Drymarchon corais couperi</i>	Indigo Snake	SSC
<u>BIRDS</u>		
<i>Ajaia ajaia</i>	Roseate Spoonbill	SSC
<i>Aramus guarana</i>	Limpkin	SSC
<i>Casmerodius albus</i>	Great Egret	SSC
<i>Charadrius melodus</i>	Piping Plover	T
<i>Egretta rufescens</i>	Reddish Egret	SSC
<i>Egretta thula</i>	Snowy Egret	SSC
<i>Egretta tricolor</i>	Tricolored (Louisiana) Heron	SSC
<i>Egretta caerulea</i>	Little Blue Heron	SSC
<i>Eudocimus albus</i>	White Ibis	SSC
<i>Falco peregrinus tundrius</i>	Artic Peregrine Falcon	E
<i>Haematopus palliatus</i>	American Oystercatcher	SSC
<i>Nyctanassa violacea</i>	Yellowcrowned Nigh Heron	SSC

THREATENED AND ENDANGERED SPECIES

TABLE 3

<i>Nycticorax nycticorax</i>	Blackcrownd Nigh Heron	SSC
<i>Pandion haliaetus</i>	Osprey	SSC
<i>Pelecanus occidentalis</i>	Brown Pelican	SSC
<i>Plegadis falcinellus</i>	Glossy Ibis	SSC
<i>Sterna antillarum</i>	Least Tern	T
<i>Vireo altiloquus</i>	Blackwhiskered Vireo	R

FISHES

<i>Centropomus undecimalis</i>	Common Snook	SSC
<i>Gobionellus stigmaturus</i>	Spottail Goby	SSC
<i>Oostethus lineatus</i>	Opossum Pipefish	R
<i>Rivulus marmoratus</i>	Rivulus	SSC

STATUS DESIGNATION KEY:

E=Endangered
T=Threatened
R=Rare
SSC=Species of Special Concern

The status of the above listed plant and animal species was determined by one or more of the following agencies and/or publications:

Florida Game and Freshwater Fish Commission; United States Fish and Wildlife Service; Florida Department of Agriculture; Rare and Endangered Biota of Florida (Pritchard Series).

BIRD SPECIES OBSERVED AT JOHN D. MACARTHUR BEACH STATE PARK

Common Loon	<i>Gavia immer</i>
Pied-Billed Grebe	<i>Podilymbus podiceps</i>
Brown Pelican	<i>Pelecanus occidentalis carolinensis</i>
Double-Crested Cormorant	<i>Phalacrocorax auritus</i>
Water-Turkey	<i>Anhinga anhinga</i>
Man-O'-War Bird	<i>Fregata magnificens</i>
Great Blue Heron	<i>Ardea herodias</i>
Snowy Egret	<i>Egretta thula</i>
Reddish Egret	<i>Dichromanassa rufescens</i>
Louisiana Heron	<i>Hydranassa tricolor</i>
Little Blue Heron	<i>Florida coerula</i>
Green Heron	<i>Butorides striatus</i>
Black-Crowned Night Heron	<i>Nycticorax nycticorax</i>
Yellow-Crowned Night Heron	<i>Nyctanassa violacea</i>
American Bittern	<i>Botaurus lentiginosus</i>
Least Bittern	<i>Ixobrychus exilis</i>
Wood Stork	<i>Mycteria americana</i>
White Ibis	<i>Eudocimus albus</i>
Roseate Spoonbill	<i>Ajaia ajaja</i>
Lesser Scaup	<i>Aythya affinis</i>
White-Winged Scoter	<i>Melanitta deglandi</i>
Surf Scoter	<i>Melanitta perspicillata</i>
Red-Breasted Merganser	<i>Mergus serrator</i>
Turkey Vulture	<i>Cathartes aura</i>
Black Vulture	<i>Coragyps atratus</i>
Sharp-Shinned Hawk	<i>Accipiter striatus</i>
Cooper's Hawk	<i>Accipiter cooperii</i>
Red-Tailed Hawk	<i>Buteo jamaicensis</i>
Red-Shouldered Hawk	<i>Buteo lineatus</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Osprey	<i>Pandion haliaetus carolinensis</i>
Peregrine Falcon	<i>Falco peregrinus</i>
Merlin	<i>Falco columbarius</i>
Kestrel	<i>Falco sparverius</i>
Limpkin	<i>Aramus guarana</i>
Clapper Rail	<i>Rallus longirostris</i>
Virginia Rail	<i>Rallus limicola</i>
Sora	<i>Porzana carolina</i>
Coot	<i>Fulica americana</i>
American Oystercatcher	<i>Haematopus palliatus</i>
Semipalmated Plover	<i>Charadrius semipalmatus</i>
Wilson's Plover	<i>Charadrius wilsonia</i>
Killdeer	<i>Charadrius vociferus</i>
Black-Bellied Plover	<i>Pluvialis squatarola</i>
Ruddy Turnstone	<i>Arenaria interpres</i>
Spotted Sandpiper	<i>Actitis macularia</i>
Willet	<i>Catoptrophorus semipalmatus</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i>
Lesser Yellowlegs	<i>Tringa flavipes</i>
Least Sandpiper	<i>Calidris minutilla</i>
Dowitcher	<i>Limnodromus griseus</i>
Semipalmated Sandpiper	<i>Calidris pusillus</i>
Western Sandpiper	<i>Calidris mauri</i>
Sanderling	<i>Calidris alba</i>
Dunlin	<i>Calidris alpina</i>
Great Black-Billed Gull	<i>Larus marinus</i>
Ring-Billed Gull	<i>Larus delawarensis</i>
Laughing Gull	<i>Larus atricilla</i>
Bonaparte's Gull	<i>Larus philadelphia</i>
Forster's Tern	<i>Sterna forsteri</i>
Least Tern	<i>Sterna albifrons</i>
Royal Tern	<i>Sterna maxima</i>

BIRD SPECIES OBSERVED AT JOHN D. MACARTHUR BEACH STATE PARK - CONTINUED

Sandwich Tern	<i>Sterna sandvicensis</i>
Caspian Tern	<i>Sterna caspia</i>
Black Skimmer	<i>Rynchops niger</i>
Rock Dove	<i>Columba livia</i>
Mourning Dove	<i>Zenaida macroura</i>
Ground Dove	<i>Columbina passerina</i>
Yellow-Billed Cuckoo	<i>Coccyzus americanus</i>
Screech Owl	<i>Otus asio</i>
Great Horned Owl	<i>Bubo virginianus</i>
Chuck-Will's Widow	<i>Caprimulgus carolinensis</i>
Common Nighthawk	<i>Chordeiles minor</i>
Ruby-Throated Hummingbird	<i>Archiochus colubris</i>
Belted Kingfisher	<i>Megasceryle alcyon</i>
Flicker	<i>Colaptes auratus</i>
Pileated Woodpecker	<i>Dryocopus pileatus</i>
Red-Bellied Woodpecker	<i>Melanerpes carolinus</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>
Great Crested Flycatcher	<i>Myiarchus crinitus</i>
Tree Swallow	<i>Iridoprocne bicolor</i>
Barn Swallow	<i>Hirundo rustica</i>
Purple Martin	<i>Progne subis</i>
Blue Jay	<i>Cyanocitta cristata</i>
Fish Crow	<i>Corvus ossifragus</i>
House Wren	<i>Troglodytes aedon</i>
Carolina Wren	<i>Thryothorus ludovicianus</i>
Mockingbird	<i>Mimus polyglottos</i>
Catbird	<i>Dumetella carolinensis</i>
Brown Thrasher	<i>Toxostoma rufum</i>
Robin	<i>Turdus migratorius</i>
Blue-Gray Gnatcatcher	<i>Polioptila coerulea</i>
Starling	<i>Sturnus vulgaris</i>
White-Eyed Vireo	<i>Vireo griseus</i>
Solitary Vireo	<i>Vireo solitarius</i>
Black-Whiskered Vireo	<i>Vireo altiloquus</i>
Red-Eyed Vireo	<i>Vireo olivaceus</i>
Black and White Warbler	<i>Mniotilta varia</i>
Parula Warbler	<i>Parula americana</i>
Cape May Warbler	<i>Dendroica tigrina</i>
Black-Throated Blue Warbler	<i>Dendroica caerulescens</i>
Yellow-Rumped Warbler	<i>Dendroica coronata</i>
Yellow-Throated Warbler	<i>Dendroica dominica</i>
Prairie Warbler	<i>Dendroica discolor</i>
Palm Warbler	<i>Dendroica palmarum</i>
Oven-Bird	<i>Seiurus aurocapollus</i>
Northern Waterthrush	<i>Seiurus noveboracensis</i>
Yellow-Throat	<i>Geothypis trichas</i>
American Redstart	<i>Setophaga ruticilla</i>
Red-Wing Blackbird	<i>Agelaius phoeniceus</i>
Spotted Oriole	<i>Icterus pectoralis</i>
Boat-Tailed Grackle	<i>Quiscalus major</i>
Common Grackle	<i>Quiscalus quiscula</i>
Cardinal	<i>Cardinalis cardinalis</i>

* Information From: Resource Inventory and Analysis of the John D. MacArthur Beach State Recreation Area (Duever, et al., 1981)

TABLE 5

FISH COLLECTED IN LAKE WORTH LAGOON

MAP #	FAMILY GENUS, SPECIES	COMMON NAME	MAP #	FAMILY GENUS, SPECIES	COMMON NAME
1.	BRANCHIOSTOMIDAE	lancelet	34.	BATRACHOIDIDAE	
2.	<i>Asymmetron</i> sp.	sharptail lancelet		<i>Opsanus beta</i>	gulf toadfish
3.	CARCHARHINIDAE		35.	ANTENNARIIDAE	
	<i>Carcharhinus limbatus</i>	blacktip shark		<i>Antennarius ocellatus</i>	ocellated frogfish
4.	RAJIDAE		36.	<i>Himrio himrio</i>	sargassum fish
	<i>Raja eglaneria</i>	cleamose ray	37.	<i>Antennaris scaber</i>	splithire frogfish
5.	DASYATIDAE		38.	OGCOCEPHALIDAE	
6.	<i>Dasyatis americana</i>	southern stingray	39.	<i>Ogcocephalus radianus</i>	polkadot batfish
7.	<i>Dasyatis sabina</i>	Atlantic stingray		<i>Ogcocephalus nasutus</i>	shortnose batfish
8.	<i>Dasyatis sayi</i>	bluntnose stingray	40.	HEMIRAMPHIDAE	
	<i>Gymnura micrura</i>	smooth butterfly ray		<i>Hyporhamphus unifasciatus</i>	halfbeak
9.	ELOPIDAE		41.	BELONGIDAE	
	<i>Elops saurus</i>	ladyfish		<i>Strongylura</i> sp.	needlefish
10.	MEGALOPIDAE		42.	<i>Strongylura marina</i>	Atlantic needlefish
	<i>Megalops atlanticus</i>	tarpon	43.	<i>Strongylura notata</i>	redfin needlefish
11.	ALBULIDAE		44.	<i>Strongylura timuca</i>	timucu
	<i>Albula vulpes</i>	bonefish	45.	<i>Tylosurus acus</i>	agujon
12.	OPHICHTHIDAE		46.	CYPRINODONTIDAE	
	<i>Myrophis punctatus</i>	speckled worm eel		<i>Floridichthys carpio</i>	goldspotted killifish
13.	CLUPEIDAE		47.	<i>Fundulus confluentus</i>	marsh killifish
	<i>undetermined</i> sp.		48.	<i>Fundulus grandis</i>	gulf killifish
14.	<i>Brevoortia smithi</i>	yellowfin menhaden	49.	POECILIDAE	
15.	<i>Brevoortia tyrannus</i>	Atlantic menhaden	50.	<i>Heterandria formosa</i>	least killifish
16.	<i>Harengula</i> sp.	sardine		<i>Poecilia latipinna</i>	sailfin molly
17.	<i>Harengula chupeola</i>	false pilchard	51.	ATHERINIDAE	
18.	<i>Harengula humeralis</i>	redcar sardine	52.	<i>Membras marinica</i>	rough silverside
19.	<i>Harengula jaguana</i>	scaled sardine		<i>Menidia beryllina</i>	tidewater silverside
20.	<i>Jenkinsia lamprotaenia</i>	dwarf herring	53.	FISTULARIIDAE	
21.	<i>Jenkinsia majua</i>	little-eye herring		<i>Fistularia tabacaria</i>	bluespotted cornetfish
22.	<i>Opisthonema oglinum</i>	Atlantic thread herring	54.	SYNGNATHIDAE	
23.	<i>Sardinella aurita</i>	spanish sardine		<i>Hippocampus erectus</i>	lined seahorse
24.	ENGRAVLIDAE		55.	<i>Hippocampus zosterae</i>	dwarf seahorse
	<i>Anchoa</i> sp.	anchovy	56.	<i>Syngnathus</i> sp.	pipefish
25.	<i>Anchoa mitchilli</i>	key anchovy	57.	<i>Syngnathus floridae</i>	darky pipefish
26.	<i>Anchoa hepsetus</i>	striped anchovy	58.	<i>Syngnathus louisianae</i>	chain pipefish
27.	<i>Anchoa hepsetus</i>	dusky anchovy	59.	<i>Syngnathus pelagicus</i>	sargassum pipefish
28.	<i>Anchoa hepsetus</i>	bay anchovy	60.	<i>Syngnathus scovelli</i>	gulf pipefish
29.	SYNODONTIDAE		61.	SCORPAENIDAE	
30.	<i>Synodus foetens</i>	inshore lizardfish		<i>Scorpaena bergi</i>	goosehead scorpionfish
	<i>Trachinocephalus myops</i>	snakefish	62.	<i>Scorpaena calcarata</i>	smoothhead scorpionfish
31.	CYPRINIDAE		63.	<i>Scorpaena grandicornis</i>	plumed scorpionfish
	<i>Notropis maculatus</i>	taillight shiner	64.	TRIGLIDAE	
32.	ARIIDAE			<i>Prionotus</i> sp.	searobin
	<i>Ariopsis felis</i>	sea catfish	65.	<i>Prionotus ophryas</i>	bandtail searobin
33.	<i>Bagre marinus</i>	gafftopsail catfish	66.	<i>Prionotus scitulus</i>	leopard searobin
			67.	<i>Prionotus tribulus</i>	bighead searobin
			68.	CENTROPOMIDAE	
				<i>Centropomus pectinatus</i>	tarpon snook
			69.	<i>Centropomus undecimalis</i>	common snook

FISH COLLECTED IN LAKE WORTH LAGOON

TABLE 5

MAP #	FAMILY GENUS, SPECIES	COMMON NAME	MAP #	FAMILY GENUS, SPECIES	COMMON NAME
				SPARIDAE	
			115.	<i>undetermined sp.</i>	sheepshead
			116.	<i>Archosargus probatocephalus</i>	sea bream
			117.	<i>Archosargus rhomboidalis</i>	porgy
			118.	<i>Calamus sp.</i>	sheepshead porgy
			119.	<i>Calamus penna</i>	spottail pinfish
			120.	<i>Diplodus holbrooki</i>	pinfish
			121.	<i>Lagodon rhomboides</i>	
70.	SERRANIDAE <i>Diplectrum formosum</i>	sand perch			
71.	PRIACANTHIDOE <i>Prisigonyx alia</i>	short bigeye			
72.	APOGONIDOE <i>Apogon pseudomaculatus</i>	twospot cardinalfish			
73.	<i>Phaeoptyx pignicraria</i>	dusky cardinalfish	122.	<i>undetermined sp.</i>	drum
			123.	<i>Bairdiella chrysoura</i>	silver perch
			124.	<i>Cynoscion arenarius</i>	sand seatrout
74.	POMATOMIDAE <i>Pomatomus saltatrix</i>	bluefish	125.	<i>Cynoscion nebulosus</i>	spotted seatrout
			126.	<i>Leiostomus xanthurus</i>	spot
			127.	<i>Menicirrhus americanus</i>	southern kingfish
75.	CARANGIDAE <i>undetermined sp.</i>	jack	128.	<i>Micropogonias undulatus</i>	Atlantic croaker
76.	<i>Caranx bartholomaei</i>	yellowjack	129.	<i>Odonotus denise</i>	reef croaker
77.	<i>Caranx cynos</i>	blue runner	130.	<i>Pogonias cromis</i>	black drum
78.	<i>Caranx hippos</i>	crevalle jack	131.	<i>Sciaenops ocellata</i>	red drum
79.	<i>Caranx latus</i>	horse-eye jack	132.	<i>Umbrina coroides</i>	sand drum
80.	<i>Decapterus macarellus</i>	mackerel scad			
81.	<i>Decapterus punctatus</i>	round scad		EPHIPPIDAE	
82.	<i>Oligoplites saurus</i>	leatherjacket	133.	<i>Chaetodipterus faber</i>	Atlantic spadefish
83.	<i>Selene vomer</i>	lookdown			
84.	<i>Seriola sp.</i>	amberjack		POMACANTHIDAE	
85.	<i>Trachinotus sp.</i>		134.	<i>Pomacanthus arcuatus</i>	gray angelfish
86.	<i>Trachinotus carolinus</i>	Florida pompano			
87.	<i>Trachinotus falcatus</i>	permit		POMACENTRIDAE	
			135.	<i>Abudefduf saxatilis</i>	sergeant major
88.	CORYPHAENIDAE <i>Coryphaena hippurus</i>	dolphin			
				LABRIDAE	
89.	LUTJANIDAE <i>Lutjanus analis</i>	mutton snapper	136.	<i>Halichoeres maculipinna</i>	clown wrasse
90.	<i>Lutjanus apodus</i>	schoolmaster	137.	<i>Hemipicirrhous novacula</i>	pearly razorfi
91.	<i>Lutjanus griseus</i>	mangrove (gray) snapper			
92.	<i>Lutjanus synagris</i>	lane snapper	138.		
93.	<i>Rhomboplites aurorubens</i>	vermillion snapper	139.	<i>Cryptomus roseus</i>	blueclip parrotfish
			140.	<i>Sparisoma sp.</i>	parrotfish
			141.	<i>Sparisoma chrysopictum</i>	redtail parrotfish
				<i>Sparisoma radians</i>	bucktooth parrotfish
94.	LOBOTIDAE <i>Lobotes surinamensis</i>	triple tail			
				MUGILIDAE	
			142.	<i>Mugil sp.</i>	mullet
			143.	<i>Mugil cephalus</i>	striped mullet
95.	GERREIDAE <i>Diapterus sp.</i>	Irish pompano	144.	<i>Mugil curema</i>	white mullet
96.	<i>Diapterus aeneus</i>	striped mojarra	145.	<i>Mugil gaimardianus</i>	redeye mullet
97.	<i>Diapterus plumieri</i>	mojarra	146.	<i>Mugil trichodon</i>	fantail mullet
98.	<i>Eucinostomus sp.</i>	spotfin mojarra			
99.	<i>Eucinostomus argenteus</i>	silver jenny		SPHYRAENIDAE	
100.	<i>Eucinostomus gula</i>	tidewater mojarra	147.	<i>Sphyracna sp.</i>	great barracuda
101.	<i>Eucinostomus harengulus</i>	slender mojarra	148.	<i>Sphyracna barracuda</i>	northern sennet
102.	<i>Eucinostomus jonesii</i>	flagfin mojarra	149.	<i>Sphyracna borealis</i>	southern sennet
103.	<i>Eucinostomus melanopterus</i>	yellowfin mojarra	150.	<i>Sphyracna picudilla</i>	
104.	<i>Gerres cinereus</i>	mojarra			
105.	<i>Gerres sp.</i>	mottled mojarra		POLYNEMIDAE	
106.	<i>Ulaema lefroyi</i>		151.	<i>Polydactylus oligodon</i>	littlescale threadfin
107.	POMADASYIDAE <i>Haemulon sp.</i>	grunt		CLINIDAE	
108.	<i>Haemulon aurolineatum</i>	tomtate	152.	<i>Paroclinus fasciatus</i>	banded blenny
109.	<i>Haemulon flavolineatum</i>	French grunt			
110.	<i>Haemulon macrostomum</i>	spanish grunt		BLENNIIDAE	
111.	<i>Haemulon parrai</i>	sailors choice	153.	<i>Lupinoblennius nicholsi</i>	highfin blenny
112.	<i>Haemulon sciurus</i>	bluestriped grunt			
		striped grunt			

TABLE 5

FISH COLLECTED IN LAKE WORTH LAGOON

MAP #	FAMILY GENUS, SPECIES	COMMON NAME
	GOBIIDAE	
154.	<i>undetermined sp.</i>	goby
155.	<i>Bathygobius soporator</i>	frillfin goby
156.	<i>Coryphopterus glaucofraenum</i>	bridled goby
157.	<i>Gobionellus sp.</i>	goby
158.	<i>Gobionellus boleosoma</i>	darter goby
159.	<i>Gobionellus smaragdus</i>	emerald goby
160.	<i>Gobiosoma sp.</i>	goby
161.	<i>Gobiosoma boscii</i>	naked goby
162.	<i>Gobiosoma longipala</i>	twoscale goby
163.	<i>Gobiosoma gemmatum</i>	frecklefin goby
164.	<i>Gobiosoma robustum</i>	code goby
165.	<i>Lophogobius cyprinoides</i>	crested goby
166.	<i>Microgobius gulosus</i>	clown goby
167.	<i>Microgobius microlepis</i>	banner goby
	NOMEIDAE	
168.	<i>Poecilia cyathophrys</i>	freckled driftfish
	BOTHIDAE	
169.	<i>Bothus sp.</i>	flounder
170.	<i>Bothus ocellatus</i>	eyed flounder
171.	<i>Citharichthys macrops</i>	spotted whiff
172.	<i>Citharichthys spilopterus</i>	bay whiff
173.	<i>Paralichthys albigutta</i>	gulf flounder
174.	<i>Syccium sp.</i>	flounder
175.	<i>Syccium micranon</i>	channel flounder
176.	<i>Syccium papillosum</i>	dusky flounder
	SOLEIDAE	
177.	<i>Achirus lineatus</i>	line sole
	CYNOGLOSSIDAE	
178.	<i>Symphurus sp.</i>	tonguefish
179.	<i>Symphurus arawak</i>	caribbean tonguefish
180.	<i>Symphurus plegiosa</i>	blackchock tonguefish
	BALISTIDAE	
181.	<i>Balistes sp.</i>	triggerfish
	MONACANTHIDAE	
182.	<i>Monacanthus tomentosus</i>	scrawled filefish
183.	<i>Monacanthus sp.</i>	filefish
184.	<i>Monacanthus tomentosus</i>	fringed filefish
185.	<i>Monacanthus hispidus</i>	planchard filefish
	OSTRACIIDAE	
186.	<i>Acanthostracion quadricornis</i>	scrawled cowfish
187.	<i>Lactophrys sp.</i>	trunkfish
188.	<i>Lactophrys trigonus</i>	trunkfish
189.	<i>Lactophrys trigonus</i>	smooth trunkfish
	TETRAODONTIDAE	
190.	<i>Sphoeroides sp.</i>	puffer
191.	<i>Sphoeroides niphelus</i>	southern puffer
192.	<i>Sphoeroides spengleri</i>	bandtail puffer
193.	<i>Sphoeroides testudineus</i>	checkered puffer
	DIODONTIDAE	
194.	<i>Chilomycterus schoepfi</i>	striped burrfish
195.	<i>Diodon histrix</i>	porcupinefish

water-skiing, sunbathing, birdwatching and sightseeing. Golf is played nearby at the Lake Worth Municipal Golf Course. Peanut Island provides swimming and sunbathing beaches as well as trail and camping facilities not associated with the proposed Federal project (change in maintenance operations).

3.13 NAVIGATION.

The Atlantic Intracoastal Waterway (IWW) borders Peanut Island on the western shoreline. The IWW is a Federally maintained navigation channel. It is authorized by the 1945 Rivers and Harbors Act, and is 10 feet deep by 125 feet wide from Fort Pierce to Miami. Estimated waterway traffic in 1997 traffic was 424,00 tons (CORPS, 1998). The Palm Beach Harbor is to the immediate west of the IWW and Peanut Island, and is 6th largest port in Florida. The project was authorized in the River and Harbor Act of 1960 and was completed in 1967 with maintenance authorized to 24 feet in the Water Resources Development Act of 1986. The harbor depths authorized range from 33 feet deep in the inner channel to 24 feet deep in the north turning basin (see Figure 13). Current channel depths are 33 to 35 feet deep and vary from 300 to 400 feet wide. Harbor traffic in 1997 was 2,922,000 tons (CORPS, 1998). A quarter of the cargo is comprised of coal and petroleum.

3.14 HISTORIC PROPERTIES.

The Corps' staff archeologist conducted research on the history of Peanut Island. Because Peanut Island was initially constructed around 1918, it is unlikely that prehistoric archeological resources are located there. A former US Coast Guard Station and the Kennedy bunker (old government magazine area) are located on the island. Both are eligible for inclusion in the National Register of Historic Places. The no adverse effect determination was coordinated with the Florida State Historic Preservation Officer (SHPO) for the Peanut Island Section 1135, Environmental Restoration Project. The SHPO concurred with the Corps' no adverse effect determination for the Section 1135 Environmental Restoration Project. All work for the Change of Maintenance Operations at Peanut Island would occur within the current footprint of existing facilities. Coordination with the State Historic Preservation Officer of the State of Florida Division of Historical Resources has been conducted with the coordination of this EA (see Appendix C – Pertinent Correspondence).

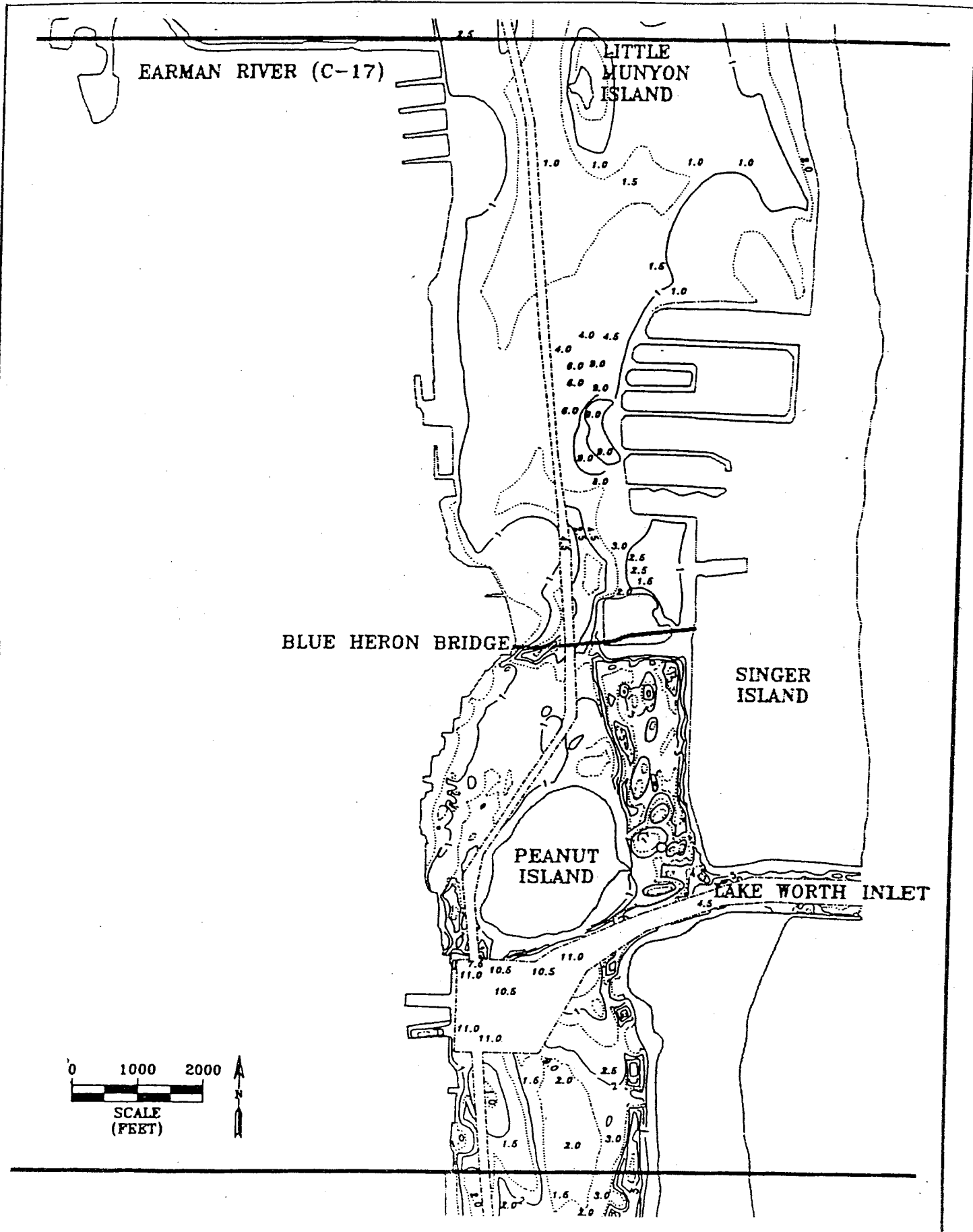
3.14.1 U.S. COAST GUARD.

The Coast Guard selected Peanut Island as a site in 1934 and, in 1937, placed in service the Lake Worth Inlet Station. The United States Coast Guard's lifesaving station and boathouse, known as the Lake Worth Inlet Station, approximately 11,980 square feet in size, was built on the southeast part of Peanut Island. The Station was one of the busiest in Florida until 1995, when the Coast Guard moved to another site, on the mainland. The station and boathouse are in the process of being restored and converted into the Palm Beach Maritime Museum.

3.14.2 KENNEDY BUNKER.

With the heightened Cold War tensions of the Cuban Missile Crisis, the Coast Guard Station took on national defense importance, due to its proximity to the Palm Beach vacation home of President John F. Kennedy. Peanut Island was only five minutes by speedboat from the Presidential Retreat. The Lake Worth Inlet Station on Peanut Island was the only secure military site suitable for a fallout shelter and command post. The Navy's Seabees, the mobile construction battalions, built the shelter, along with extensive communications facilities, in secrecy. It was designed and stocked as a command communications center to house the President and 25 to 30 others for up to 30 days. The shelter a lead-lined steel and concrete

FIGURE 13. PROJECT AREA BATHYMETRY



structure is buried in the side of the hill of dredged material on Peanut Island. Although built in 1961 and removed from use in 1964 following the President's assassination, the Federal Government did not acknowledge the existence and purpose of the shelter until 1973. The bunker is currently being restored and preserved for public viewing through the Palm Beach Maritime Museum.

4.0 ENVIRONMENTAL AFFECTS

This section is the scientific and analytic basis for the comparing of the alternatives. See Table 1 in Section 2.0 Alternatives, for Summary of Impacts. The following includes anticipated changes to the existing environment including direct, indirect and cumulative effects.

4.1 GENERAL ENVIRONMENTAL EFFECTS.

The Port of Palm Beach DMSA would be offloaded down to 4 feet above mean low water (MLW) and 3,200 linear feet of new dike to a height of 32 feet MLW would be constructed within the Port of Palm Beach DMSA boundaries. The dry offloading of the material from the DMSA is planned for offloading from the upland area of the island. Structural equipment needed for the project would be removed at completion of the project. Offloading of the stored dredged material from the Port of Palm Beach DMSA site has little, if any, adverse environmental impacts. These impacts would be temporary and proposes no long-term effect to fish and wildlife species, aesthetics, or public use. The proposed change in maintenance operations from winter hopper dredging to summer pipeline dredging would be within the Palm Beach Harbor existing dredging footprint, increase of navigation depth or side slopes would not occur.

Exotic vegetation is proposed for removal and new dikes constructed would be stabilized with xeric groundcover vegetation. Noise and odor impacts would associated with the planned activity be short term and temporary, most adverse effects would be experienced only during construction, if at all. Sea turtles and manatees should not be adversely affected by the proposed project. Protective measures and best management procedures would be in place to ensure the protected species are not harmed or their critical habitat adversely altered. Disposal of the offloaded material in the anoxic hole adjacent to the identified municipal golf course would be more cost effective and practicable environmental alternative. This option would not require further resource surveys due to extensive resources mapping and sediment analysis performed by and for Palm Beach County DERM (1999). (see Appendix F- Other Studies). The reports were reviewed and accepted during the Corps' environmental assessment of restoration efforts proposed for Peanut Island under Section 1135 or during this evaluation.

4.2 VEGETATION.

4.2.1 PROPOSED ACTION, CHANGE OF DREDGING OPERATIONS AND PALM BEACH HARBOR DISPOSAL SITE OFFLOAD ON PEANUT ISLAND.

The proposed change in winter hopper dredging of the Palm Beach Harbor to summer pipeline dredging would not adversely affect any seagrass within the project area. Dredge pipelines would avoid all known seagrass resources within the project area. The offloading of the Port of Palm Beach DMSA on Peanut Island could result in the removal of some exotic tree species. No impacts to mangroves, seagrass or the environmental restoration project on Peanut Island are anticipated during the proposed summer offloading of the Port of Palm Beach DMSA on Peanut Island.

4.2.2 DREDGED MATERIAL PLACEMENT AT THE LAKE WORTH INLET SOUTH JETTY DISPOSAL AREA.

The disposal site south of the Lake Worth Inlet Channel south jetty has been used in the past to place beach quality material nearshore and help maintain the beach in that area. No vegetation would be adversely affected by the change in maintenance operations and dredged material disposal in this area.

4.2.3 DREDGED MATERIAL PLACEMENT AT THE MIDTOWN BEACH, PALM BEACH.

The disposal site at Midtown Beach, Palm Beach, has been used in the past. Disposal at this site would keep beach quality material on the beach and within the littoral drift process. For the proposed project, a pipeline would be directed southward down the IWW just past the Flagler Memorial Bridge. The pipeline would then head east along the Breakers Golf Course and to the beach. Some ornamental vegetation and or turf could be adversely affected during the proposed project however turf and ornamental vegetation would be replaced. If this disposal option is chosen, the pipeline route would be investigated for mangroves, seagrass and hardbottom prior to project construction. Based on available information, no adverse effect is anticipated to any existing mangroves or seagrass. However, should these resources exist along the planned pipeline route, all attempts would be made to first avoid and then to minimize impacts to these aquatic resources. If impacts are unavoidable, these impacts would be appropriately compensated.

4.2.4 DREDGED MATERIAL PLACEMENT AT THE LAKE WORTH DISPOSAL SITE (LEAST COST ALTERNATIVE).

The disposal site adjacent to the City of Lake Worth Municipal Golf course is a deep anoxic hole of approximately 99 acres, the furthest away from Palm Beach Harbor and Peanut Island. It has not been used before for dredged material disposal. However, approximately 60,000 cubic yards or more of material disposal is proposed over this area from the St. Johns Island environmental restoration and IWW maintenance dredging projects. Engineering studies performed on this site has determined this disposal option has the capacity to receive a million cubic yards of material or more. The disposal of material offloaded from the southern end of Peanut Island would provide over 60 percent of the material needed to raise the elevation and provide a strata at appropriate depths for benthic organisms, marine seagrass, and fishery species. No adverse affects to mangroves or seagrass are anticipated with disposal at this location. Contrary, this disposal option would support restoration efforts that proposes 1.7 acres of fringe mangrove restoration, 11.1 acres of mangrove creation, 2.8 acres of saltmarsh creation, 2.3 acres of oyster reef creation, and 57.1 acres of suitable substrate for benthic recruitment and seagrass proliferation.

4.2.5 NO ACTION ALTERNATIVE (STATUS QUO).

A no action alternative would prevent the eradication of exotic tree species that are out competing indigenous tree species at the Port of Palm Beach DMSA. The uncontrolled growth and proliferation of exotics would eventually affect the restoration efforts proposed at Peanut Island. Such conditions would eventually reduce then eliminate those which provide beneficial detrital input to the aquatic ecosystem, replacing with species with little or no environment or public benefit.

4.3 THREATENED AND ENDANGERED SPECIES.

4.3.1 PROPOSED ACTION, CHANGE OF DREDGING OPERATIONS AT PALM BEACH HARBOR AND DISPOSAL SITE OFFLOADING ON PEANUT ISLAND.

Summer pipeline maintenance dredging activities would replace winter hopper maintenance dredging within the Congressionally authorized limits of Palm Beach Harbor project. The change in dredging method proposes no adverse effect to sea turtles. A sea turtle window (from May to November) would be observed and standard Corps manatee precaution measures would be implemented, in addition to, the Corps' adherence to BMP's. If considered necessary, a sea turtle and manatee observer would be on site during performance of in-water activities. The sea turtle and manatee observer would advise the necessary personnel of sightings with authority to shutdown operations when either species is observed within 50 yards of the project. However, it is anticipated the proposed dredging is not likely to adversely affect the sea turtle or manatee. The manatee is known to frequent the area during the winter months, seeking the warmer waters of the discharge plant located upstream and north of Peanut Island. The proposed change in maintenance operations would eliminate the additional winter manatee conditions that would be necessary to achieve the project's completion.

Dependent upon the disposal option selected, material offloaded from the Port of Palm Beach DMSA would be completed either by pipeline dredge or by dry loading with the material placed on a barge for transport. The disposal options being considered are: 1) a former disposal area south of the Lake Worth Inlet Channel south jetty, 2) a former disposal area at Midtown Beach, Palm Beach, and 3) a never used anoxic hole/former dredged marine borrow site with depth varying from -8 to -23 feet NGVD (National Geodetic Vertical Datum). Disposal options one and two would require pipeline discharge. However, disposal three the preferred and least cost alternative, would require dry offloading and barge transport. Offloading the proposed 600,000 cubic yards of stockpiled material would provide storage capacity for material anticipated from the harbor dredging. The identified threatened and endangered species do occur in the disposal area. However, no adverse impacts should occur to the species or their critical habitat. This is due to the proposed months dredging and construction would occur, the protective measures that would be in place to ensure survival of the species and the initial avoidance of impacts.

4.3.2 DREDGED MATERIAL PLACEMENT AT THE LAKE WORTH INLET SOUTH JETTY DISPOSAL AREA.

Approximately 600,000 cubic yards of dredged material stockpiled at the southern end of Peanut Island at the Port of Palm Beach DMSA would be proposed for disposal south of the Lake Worth Inlet Channel south jetty. This dredged material disposal site has been utilized in the past when suitable beach quality material has been dredged in the area. The material would be placed within the littoral drift and within the existing authorized template/footprint. Use of the material in this manner would provide storm damage reductions and nesting sea turtle habitat. No impacts or adverse affects to threatened and endangered species are anticipated. Sea turtles are known to occur along this portion of the shoreline. The USFWS initially concluded the project "may effect" four listed threatened or endangered species of sea turtles, the loggerhead sea turtle (*Caretta caretta*), the green sea turtle (*Chelonia mydas*), the leatherback sea turtle (*Dermochelys coriacea*), and the hawksbill sea turtle (*Eretmochelys imbricata*). However, the USFWS final determination is that the project is not likely to adversely affect the threatened and endangered sea turtles. (see Appendix C – Pertinent Correspondence, USFWS November 1997). Currently there is no critical habitat designated for the sea turtle. The project proposes no adverse impacts to the continued survival of the species. If this disposal alternative is chosen, an on-site observer would be available during construction to advise and shutdown all work should the species occur within 50 feet of operations.

H. johnsonii has been documented to occur in the immediate area and vicinity of Peanut Island and coordination was initiated with NMFS in accordance with the Endangered Species Act and The Magnuson-Stevens Fishery Conservation and Management Act. Conservation Recommendations were received which the Corps has addressed to some degree with other projects proposed or completed in or adjacent to Lake Worth and Lake Worth Lagoon (i.e., Munyon Island Environmental Restoration, IWW, Palm Beach County maintenance dredging projects, Johns Island Environmental Restoration, or Peanut Island Environmental Restoration). Other conservation recommendations of NMFS that have not been addressed have been reviewed for application where appropriate and consistency with the Corps' navigation and environmental missions. (see Appendix C – Pertinent Correspondence, NMFS May 2002).

4.3.3 DREDGED MATERIAL PLACEMENT AT THE MIDTOWN BEACH, PALM BEACH.

Approximately 600,000 cubic yards of dredged material stockpiled at the Port of Palm Beach DMSA on the south end of Peanut Island would be placed on the beach disposal site south of the Breakers Hotel. This dredged material disposal site has been used in the past when suitable beach quality material has been dredged in the area. This disposal option would keep the dredged material within the littoral drift process and help to provide storm damage reductions. Sea turtles are known to occur along this portion of the shoreline and the USFWS initially concluded the project "may effect" the species listed above. However, the agency later determined the work is not likely to adversely affect the listed species. (see Appendix C – Pertinent Correspondence, USFWS November 1997). Currently there is no critical habitat designated for the sea turtle; and the project proposes no adverse impacts to the continued survival of the species. If this disposal option is chosen, an on-site observer would be available during construction to advise and shutdown all work should the species occur within 50 feet of construction.

4.3.4 DREDGED MATERIAL PLACEMENT AT THE LAKE WORTH DISPOSAL SITE (LEAST COST ALTERNATIVE).

Approximately 600,000 CY of dredged material stockpiled at the Port of Palm Beach DMSA on the south end of Peanut Island would be dry loaded and barged to the Lake Worth Disposal Area. This disposal site located adjacent to the shoreline of the City of Lake Municipal Golf Course and the footprint of the IWW eastern right-of-way. Classified as an anoxic hole and/or marine borrow site of about 99 acres, this area would benefit from the placement of dredged material. It is estimated the site is capable of receiving over one million cubic yards of dredge material. Placement of suitable dredged material in this area would raise benthic elevations and promote seagrass recruitment. Approximately 0.91 acre of *H. johnsonii* (Johnson seagrass), a marine seagrass listed as threatened by the NMFS as of October 14, 1998, occur in several locations near shore. Approximately 0.25 acre of Johnson seagrass resources would be adversely impacted by restoration efforts proposed at this location. These impacts are not associated with this project but are part of the overall environmental restoration efforts to restore 1.7 acre of mangrove fringe, create 11.1 acre of mangrove stand, 2.8 acres of saltmarsh, 2.3 acres of oyster reef, and 57.1 acres of seagrass recruitment substrate. The proposed environmental restoration would offset and compensate resources impacts, exceeding agencies current mitigation requirements. Beyond the identified impacts, no adverse effect to threatened and endangered species is anticipated.

4.3.5 NO ACTION ALTERNATIVE (STATUS QUO).

A no action alternative would preclude disposal of materials stockpiled on Peanut Island. This alternative would dictate the location and purchase of land(s) capable of containing the proposed material with suitable upland area, proposes no impacts to threatened and

endangered species, and offers the necessary clearance from residential areas. A no action alternative would prevent the removal of exotics species and would continue the uncontrolled growth of such vegetation. Such conditions would have adverse environmental impact on indigenous species and the environmental restoration efforts proposed for Peanut Island.

4.4 HARDGROUNDS.

Marine habitats called hardgrounds are known to exist within the project region. Rock outcrops, rock substrate and worm rock are examples of hardgrounds. Impacts to these natural resources are governed by the USFWS. DEP has defined a zone where hardgrounds are likely to be found, as the area landward of the 4-meter depth contour in the Atlantic Ocean or Gulf of Mexico. These geological formations are known to extend from the St Lucie and Martin counties southward (USFWS, 1999).

4.4.1 PROPOSED ACTION, CHANGE OF DREDGING OPERATIONS AT PALM BEACH HARBOR AND DISPOSAL SITE OFFLOADING ON PEANUT ISLAND.

Summer pipeline maintenance dredging activities would replace winter hopper maintenance dredging within the Congressionally authorized limits of the Palm Beach Harbor project. The offloading of dredged material from the Port of Palm Beach DMSA would be completed by pipeline dredge or by dry loading the material onto barges and placing the material in one of three locations: 1) south of the Lake Worth Inlet Channel south jetty, 2) Midtown Beach, Palm Beach, or 3) a 99-acre anoxic hole. The existing berm at the Port of Palm Beach DMSA site at the southern end of the Peanut Island would be excavated down 4 feet above mean low water and 3,200 linear feet of new berm constructed. Summer maintenance dredging of Palm Beach Harbor would also occur with the proposed changes. No aspect of the project proposes any adverse impacts to the environment, public use, fish and wildlife species, or endangered and threatened species. The project would benefit these values with the lowering of the existing berms, removing exotic species, and creating benefits that have long-term environmental functions and values.

4.4.2 DREDGED MATERIAL PLACEMENT AT THE LAKE WORTH INLET SOUTH JETTY DISPOSAL AREA.

Approximately 600,000 CY of dredged material stockpiled at the Port of Palm Beach DMSA, on the south end of Peanut Island, would be placed in the dredged material disposal site south of the Lake Worth Inlet Channel south jetty. The dredged material disposal site has been utilized in the past when suitable beach quality material has been dredged in the area. This disposal option would keep the dredged material within the littoral drift process and help to provide storm damage reductions. Hardgrounds impacts would have to be addressed with this disposal alternative. There are at two known locations within the immediate project vicinity, within the entrance channel of Lake Worth Inlet. Potential adverse impacts to these resources could occur from the disposal, if disposal material drifted from the existing template. The occurrence of this action occurring is small, given the monitoring requirement dictated by the Corps (plans and specs.) and the requirements of the project to meet and maintain the State's water quality standards. However, should this disposal alternative be recommended, resource surveys would be conducted prior to construction/disposal activities to ensure the submerged resources are identified, marked, and protected from coverage.

4.4.3 DREDGED MATERIAL PLACEMENT AT THE MIDTOWN BEACH, PALM BEACH.

This dredged material disposal site has been used in the past when suitable beach quality material has been dredged in the area. This disposal option would keep the dredged material within the littoral drift process and help to provide storm damage reductions. Should this

disposal alternative be recommended, resource surveys would be conducted prior to construction/disposal activities to ensure any existing resources are identified, marked and protected from coverage. It is not anticipated that any submerged resources would be adversely impacted. Material disposal would be maintained within the authorized template.

4.4.4 DREDGED MATERIAL PLACEMENT AT THE LAKE WORTH DISPOSAL SITE (LEAST COST ALTERNATIVE).

The Lake Worth Disposal Area is located adjacent to the shoreline of the City of Lake Municipal Golf Course and the footprint of the IWW right-of-way just south of Canal 51 (C-51, in Lake Worth Lagoon). The anoxic hole would benefit from the placement of dredged material. The benthic elevations in the area would be raised to promote recruitment of seagrasses. The dredged material would be dry loaded and barged to the disposal site adjacent to the IWW channel. The dredged material would be dumped in the disposal site while the barge is anchored over the anoxic hole. There are no known hardgrounds covers in this area. No impacts or adverse affects to hardgrounds are anticipated from this disposal alternative.

4.4.5 NO ACTION ALTERNATIVE (STATUS QUO).

A no action alternative proposes potential adverse impacts to submerged resources. This alternative would also prevent the use of Peanut Island as a dredged material storage site during the maintenance dredging of Palm Beach Harbor. In addition to, continuing the proliferation of exotics presently growing on the island.

4.5 FISH AND WILDLIFE RESOURCES.

4.5.1 PROPOSED ACTION, CHANGE OF DREDGING OPERATIONS AND PALM BEACH HARBOR DISPOSAL SITE OFFLOAD OF PEANUT ISLAND.

The proposed change in maintenance operation from winter hopper dredging to summer pipeline dredging of the Palm Beach Harbor would need to be completed prior to the USFWS sea turtle window that extends from May 1 until November. An endangered species observer would help to prevent sea turtle and manatee incidents during project construction. West Indian manatees are also known to frequent the proposed project area and have been seen congregating around the power plant during colder temperatures. Standard Corps manatee precaution measures would need to be implemented for this aspect of the proposed project. Migratory birds are not anticipated to be a project concern.

4.5.2 DREDGED MATERIAL PLACEMENT AT THE LAKE WORTH INLET SOUTH JETTY DISPOSAL AREA.

This dredged material disposal alternative would need to observe the USFWS sea turtle window and requires an endangered species observer on the vessel at all times. Manatee precautions would need to be implemented to ensure adverse impacts to manatees did not occur. There should be no adverse impacts to seagrass from this alternative. Material disposal would be within an existing template/footprint. No expansion of the existing authorization is proposed or necessary. If considered necessary, a seagrass survey would be undertaken and completed prior to any disposal activities. This action would ensure any existing resources are identified, marked and protected. No adverse impacts to migratory birds are anticipated.

4.5.3 DREDGED MATERIAL PLACEMENT AT MIDTOWN BEACH, PALM BEACH.

This dredged material disposal alternative would also need to be undertaken outside of the USFWS sea turtle window. Vessels would need to have an endangered species observer onboard as recommended by the Corps standard manatee precaution measures. Migratory birds are not anticipated to be a concern of the project. No adverse impacts are anticipated to seagrass resources. Material placement would be within an existing disposal footprint. No

expansion of the existing footprint is proposed or necessary. If considered necessary a seagrass survey would be completed prior to any disposal activities. This action would ensure that any existing resources are identified, marked, and protected. Standard Corps manatee precautions would need to be implemented to ensure adverse impacts to manatees did not occur.

4.5.4 DREDGED MATERIAL PLACEMENT AT THE LAKE WORTH DISPOSAL SITE (LEAST COST ALTERNATIVE).

This site is primarily a large anoxic hole/depressional tidal area with mud bottom marine habitat. Containing approximately 99 acres with depth varying from -8 to -23 feet NGVD, the site is capable of receiving 1,000,000 CY or more of dredged material. This disposal alternative would need to be undertaken outside of the USFWS sea turtle window. Vessels would need an endangered species observer as recommended by the Corps standard manatee precaution measures. The disposal of material at this location would raise the benthic grade to between the +1-foot to -5-foot elevation NGVD. Palm Beach County Department of Environmental Resources Management (DERM), conducted sea grasses surveys of the disposal area, October 8, 1998, and September 14 and 15, 2000. (see Appendix C, Pertinent Correspondence, Palm Beach DERM October 2001). The reports document a total seagrass cover of 1.29 acres in the shallow water areas near the shore between elevations -1.5 feet and -3.5 feet NGVD. The endangered species *H. johnsonii* (Johnson seagrass) occupy about 0.92 acre of the total seagrass cover, occurring in a narrow discontinuous band along the western edge of the Lake Worth Lagoon shoreline.

Joint environmental restoration proposed at this location by Palm Beach County, FIND, the City of Lake Worth, and the Corps would impact about 0.25 acre of the endangered Johnson seagrass. The project, however, has the potential to provide approximately 57 acres of seagrass. It is anticipated Johnson seagrass would be a recruitment species. The project further proposes restoration to 1.7 acres of mangrove fringe, 2.8 acres of saltmarsh creation, 2.3 acres of oyster reef, and 11.1 acres of mangrove creation. About 40 percent of the material needed to raise the elevations at this site would come from the offloading of material from Johns Island and the northern end of Peanut Island. If this disposal option is chosen for disposal of material from the southern end of Peanut Island, approximately 60 percent of the needed material could be obtained.

Migratory birds are not anticipated to be a concern of the proposed action.

4.5.5 NO ACTION ALTERNATIVE (STATUS QUO).

The no action alternative would limit the scope of environmental restoration efforts proposed at this location. A no action alternative would preclude the Corps from the use of mitigation measures that could be available to support future navigation missions in this area.

4.6 HISTORIC PROPERTIES.

Two historic structures exist on Peanut Island, a former U.S. Coast Guard Station that was placed in service in 1937 and the bunker used to protect President Kennedy during the Cuban Missile Crisis in 1962. Both structures are eligible for inclusion in the National Register of Historic Places but are not listed at this time. The change in operations maintenance project and offloading of dredged material from the Port of Palm Beach DMSA would be performed adjacent to both historic sites. Existing dike elevations will be lowered and grassed when construction has been completed. The Corps' archeologist has coordinated the proposed work with the Florida State Historic Preservation Officer (SHPO). No adverse impacts are anticipated to these resources.

No historical resources are known to exist at the proposed disposal sites. It is the SHPO opinion the work proposed adjacent LWMGC would not impact any sites eligible for listing in the *National Register of Historic Places*. A no effect determination has been received. (see Appendix C - Pertinent Correspondence, Fla. DHR Letter, Sept 2000). The Corps is coordinating this determination with SHPO.

4.7 SOCIO-ECONOMIC.

The use of the Palm Beach Harbor DMSA is considered a convenient and cost effective method for temporary and long-term storage of dredged material obtained from maintenance of Palm Beach Harbor. Other alternative disposal sites or ocean disposal sites are generally cost prohibitive, either being located further away, or present difficulty in achieving the standards required at DMSA sites, or propose impacts to aquatic and environmental resources.

4.8 NAVIGATION.

Maintenance of Palm Beach Harbor is an annual event with the minimum amount of material dredged 25000 CY. (see Appendix D – Engineering Information, Letter Report). Offloading stockpiled dredged material from Peanut Island would provide the necessary disposal capacity within proximity of dredging activities. No adverse affects to navigation within the project area are expected. Maintenance of the Harbor would continue the Corps' mission to provide free and unobstructed navigation of the nation's waters. Disposal of the dredged material is an essential component to the Corps' mission. Beach disposal is an alternative, but usually not the most cost effective alternative and includes inherent environmental consequences to area threatened or endangered species. Ocean disposal is not an available alternative for this project, being cost prohibited, and requires approval by the U.S. Environmental Protection Agency (EPA), and is usually reserved for sediments with high levels of contaminants and pollutants. The disposal alternative that allows maximum offloading of material, is cost effect, and provides environmental benefits. The recommended and preferred alternative is located adjacent to the City of Lake Worth Municipal Golf Course.

4.9 AESTHETICS.

The proposed project is a change of maintenance operations from winter hopper dredging to summer pipeline dredging for Palm Beach Harbor and the offload of dredged material from the Port of Palm Beach DMSA at the southern end on Peanut Island. Area aesthetics would be improved with lowering of the DMSA berm to -32 feet above mean low water. This value receives benefits also with the proposed removal of exotic plant species. No adverse impacts to the area's aesthetic values are anticipated.

4.10 RECREATION.

Palm Beach County in partnership with FIND proposes to create amenities that support a public use park. This area would be located on 50 acres at the north end of Peanut Island and would be in addition to the proposed \$5.9 million environmental restoration of Peanut Island. Some temporary disruption to the public's recreation pursuits would be expected during construction. These impacts would be temporary and propose no long-term adverse impacts.

4.11 COASTAL BARRIER RESOURCES.

The proposed change in maintenance operations and related activities are adjacent to or within a designated Coastal Barrier Resource Unit. A review of the USFWS Coastal Barrier Resource Maps locates the nearest Coastal Barrier Resource Unit two miles north of the proposed project area (FL-18P – John D. MacArthur Beach State Recreation Area). No adverse impacts are anticipated to this resource.

4.12 WATER QUALITY.

The proposed project would comply with all Federal and State water quality requirements. All directives in the issued environmental permits would be followed to ensure any generated turbidity is monitored and contained as required. Water quality data has been collected in Lake Worth Lagoon since the late 1960's. The data indicates that the lagoon is a moderately polluted estuarine system. A trend analysis indicates water quality remained either fairly constant or improved slightly over a fifteen-year period. Analysis of sediments for heavy metals and organic compounds indicate a system that chronically receives runoff from urban development (Dames and Moore, 1999). A source of this runoff would be diverted with improvement proposed to the Canal Number 51 (south of the City of Lake Worth disposal option) which releases a large volume of freshwater in to the Lake Worth estuary. Adverse affects from project-generated turbidity are not anticipated. The disposal alternatives have been selected to minimize impacts to water quality.

4.13 SOLID WASTE.

The Corps would not expect solid waste management issues to be a concern with the proposed change in maintenance operations project proposed at the Port of Palm Beach Harbor or Peanut Island. A change in the Port of Palm Beach maintenance dredging from winter hopper to summer pipeline dredging may involve some dredged material that is not suitable for beach disposal. This material would be disposal of in a suitable and approved location. Offloading the Port of Palm Beach DMSA into the least cost alternative disposal area should not present any solid waste management issues either. The disposal of the offloaded dredged material to other disposal alternatives could involve other management issues. The issues would be addressed/resolved when and if they materialize.

4.14 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE.

Palm Beach County completed a Phase I Environmental Site Assessment for Peanut Island, in November 1997, Environmental Resources Management report. The results of their investigation showed there were no hazardous, toxic and radioactive wastes (HTRW) on the island. The preliminary HTRW investigation was completed in June 2000 as per ER1165-2-123, HTRW Guidance For Civil Works Projects and showed in general, no evidence of HTRW. No HTRW management issues are anticipated with the Peanut Island offload, disposal, or maintenance dredging of the Palm Beach Harbor. Remediation of the site would occur, should contaminants be encountered during the project's construction.

4.15 AIR QUALITY.

Construction activities would produce some minor and temporary impacts (dust and exhaust) to air quality within the project area. Once construction activities are completed, these impacts should dissipate and air quality should return to pre-construction levels. Minor impacts to air quality would be expected from the other project disposal alternatives also. These potential, minor, temporary air quality impacts would return to pre-construction conditions once the project has been completed.

4.16 NOISE.

The potential for some increase in noise to the surrounding project area is anticipated but to the degree or extent would depend on the proximity of the surrounding areas. Adverse affects generated by construction noise are not anticipated to be substantial or even noticeable. The distance of residential development from the proposed project location and the existing vegetative buffers will dissipate construction noise of any significance before it becomes problematic.

4.17 PUBLIC SAFETY.

No adverse impacts are anticipated to public safety issues associated with the proposed action or dredged material disposal alternatives.

4.18 ENERGY REQUIREMENTS AND CONSERVATION.

Use of the Port of Palm Beach DMSA on Peanut Island would be as or more energy efficient than use of the other disposal alternatives discussed in this EA for the summer pipeline maintenance dredging of Port of Palm Beach. Beach, ocean and most other disposal options are further away, would require more energy and generally cost more to complete. The least cost alternative to offload and dispose of dredged material from the Port of Palm Beach DMSA is the anoxic hole adjacent to the City of Lake Worth Municipal Golf Course. This alternative would be as or more energy efficient than other disposal alternatives discussed in this EA.

4.19 NATURAL OR DEPLETABLE RESOURCES.

The change in maintenance operations at the Port of Palm Beach and Peanut Island would adversely affect natural or depletable resources. Placement of the dredged material stored at the Port of Palm Beach DMSA on Peanut Island into the anoxic hole adjacent to the City of Lake Worth Municipal Golf Course would provide benthic elevations in the disposal area that could recruit seagrass and provide aquatic habitat value in the future. Beach placement would also make practical use of the dredged material and provide habitat area for nesting sea turtles. Ocean disposal would largely make the sand inaccessible.

4.20 SCIENTIFIC RESOURCES.

No notable impacts on any scientific resources by the proposed action of least cost alternative are anticipated.

4.21 NATIVE AMERICANS.

The likelihood is small of any Native American artifacts or resources existing on Peanut Island. Peanut Island was constructed in 1918 from dredged material disposal. The same status would apply to the harbor and disposal sites. Past impacts from dredging activities would have adversely impacted any resources that may have existed. Research undertaken prior to any federally project would have ensured that no adverse impacts resulted to any resources existing. We do not expect any impacts on Native Americans resources by the proposed action or disposal alternatives.

4.22 CUMULATIVE IMPACTS.

Cumulative impacts are those impacts on the environment that results from the incremental impact of an action when added to other past, present and reasonably foreseeable future actions (40 CFR 1508.7). The proposed action would occur within the existing Port of Palm Beach footprint for the Harbor. Only a change in dredging method and timing of the proposed work and related activities are proposed. Namely, winter hopper dredging would be replaced with summer pipeline dredging with dry loading of material from the southern end of the island. Disposal of the offloaded material at the preferred alternative (least cost disposal alternative) would provide beneficial benthic elevations for seagrass recruitment and other benthic organisms in the Lake Worth Lagoon near the C-51 outfall. This disposal option is expected to produce minimal adverse cumulative impacts as compared to other proposed alternatives (other than the no action). Marine seagrass in Lake Worth and Lake Worth Lagoon would experience over 20 acres of adverse impacts from navigation and other project proposed in this area. The

principal impacts would result from channel maintenance and dredging of basins and slips where seagrass species have become established. Success of the mitigation proposed adjacent to the municipal golf course would offset the proposed impacts. Seagrass recruitment may have a higher success ratio upon completion of the C-51 project that would eventually remove a large source of freshwater input from the Lake Worth Lagoon estuary. Mitigation credit would be sought for benefits to seagrass, mangrove, and other habitats associated with the filling of the dredge hole. The mitigation credit would be used to offset impacts from future dredging projects.

4.23 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES.

4.23.1 IRREVERSIBLE.

An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. The Corps do not anticipate any irreversible commitment of resources for the proposed action (other than fuel and materials for construction). The use of some other disposal alternatives (besides the least cost alternative) may result in a loss of the dredged material resource to the littoral drift process of the Atlantic Ocean coast.

4.23.2 IRRETRIEVABLE.

An irretreivable commitment of resources is one in which due to decisions to manage the resource for another purpose, opportunities to use or enjoy the resources as they presently exist are lost for a period of time. An example of an irretreivable loss might be where a type of vegetation is lost due to road construction. We do not expect any notable irreversible commitment of resources for the proposed action. Some loss of exotic vegetation within the Port of Palm Beach DMSA may occur during construction. This loss is anticipated and would be promoted with construction of the project. The construction of the least cost dredged disposal alternative would provide suitable benthic elevations to restore some habitat value in the area of the City of Lake Worth Municipal Golf Course shoreline.

4.24 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS.

Unavoidable adverse environmental impacts generated from the proposed action would be relatively minor. Impacts from various alternatives may be greater (see impacts discussed in the above sections).

4.25 LOCAL SHORT-TERM USES AND MAINTENANCE/ENHANCEMENT OF LONG-TERM PRODUCTIVITY.

The proposed action would increase the storage capacity of the Port of Palm Beach DMSA on the southern end of Peanut Island. Since the dredged material would be offloaded from the site and used for an environmental habitat restoration project (least cost disposal alternative), there would be no anticipated adverse affects to local short-term uses of the Peanut Island site. The long-term use of the Peanut Island disposal site would also be established for future summer pipeline maintenance dredging operations of the Port of Palm Beach. Disposal options other than the Least Cost Alternative would most likely cost more and require long-term considerations to be more extensively studied.

4.26 INDIRECT EFFECTS.

The change of maintenance operations at the Port of Palm Beach and the offloading of the Port of Palm Beach DMSA would contribute to the economical maintenance and possible future prosperity of Palm Beach Harbor.

4.27 COMPATIBILITY WITH FEDERAL, STATE AND LOCAL OBJECTIVES.

Since Port of Palm Beach and the associated DMSA are established facilities, it should not be contrary to Federal, State or local objectives and land use planning.

4.28 CONTROVERSY.

The only potential controversies with the proposed Federal project would be the extent and degree of adverse affects to the historic resources on Peanut Island adjacent to the Port of Palm Beach DMSA and the degree of adverse impacts to existing seagrass within the project area. Some potential controversy regarding essential fish habitat (seagrass) could also be expressed. All necessary coordination has been initiated to ensure any and all controversy to the project have been addressed or resolved.

4.29 UNCERTAIN, UNIQUE, OR UNKNOWN RISKS.

No uncertain, unique or unknown risks have been identified nor are they anticipated with the construction of the proposed Federal project.

4.30 PRECEDENT AND PRINCIPLE FOR FUTURE ACTIONS.

The change in maintenance operations from winter hopper dredging to summer pipeline dredging is not anticipated to set a precedence or principle for future actions. The dry offloading of the Port of Palm Beach DMSA and rehabilitation of the existing dikes is not anticipated to set precedent or principle for future actions.

4.31 ENVIRONMENTAL COMMITMENTS.

The U.S. Army Corps of Engineers and contractors commit to avoiding, minimizing, or mitigating adverse effects during the project construction activities. These commitments are written into the contract's specifications as following: (1) All water-based activities shall follow Jacksonville District US Army Corps of Engineers Standard Manatee Protection Conditions; (2) USFWS turtle window requirements, conditions and recommendations shall be followed; (3) The Jacksonville District, US Army Corps of Engineers, Migratory Bird Protection Policy would be followed if any migratory birds are encountered, (4) All water turbidity requirements listed in the State of Florida's water quality certificate permit would be implemented, (5) Invasive species management shall be undertaken to reduce species where possible and prevent their distribution in all instances, (6) All seagrass impacts shall be avoided where possible, minimized or mitigated as appropriate under the direction of the National Marine Fisheries Service, (7) Prior to construction, the State must concur with the Coastal Zone Consistency Statement (Appendix B), (8) Dike rehabilitation work would occur within the existing dike footprint, (9) Prior to construction, the State Historic Preservation Officer must concur with the Jacksonville District's determination of no effect on any eligible historic resources.

4.32 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS.

4.32.1 NATIONAL ENVIRONMENTAL POLICY ACT of 1969, as amended.

Environmental information on the project has been compiled and this Environmental Assessment and Finding of No Significant Impact have been prepared and will be circulated prior to the commencement of the project in accordance with requirements of the National Environmental Policy Act (NEPA), as amended. A public notice would follow the EA.

4.32.2 ENDANGERED SPECIES ACT of 1973, as amended.

A list of endangered, threatened, proposed, or candidate species that may inhabit the project area was received from both the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). This project has been fully coordinated under the Endangered Species Act; and therefore, would be in full compliance with the Act.

4.32.3 FISH AND WILDLIFE COORDINATION ACT of 1958, as amended.

In response to the requirements of this Act, the District has and would continue to maintain coordination with the USFWS during all stages of the planning and construction process. The USFWS (October 3, 1994 letter) had no objection to the restoration project as long as Corps' standard manatee protection guidelines were followed and maintained during the project construction (see APPENDIX C –Pertinent Correspondence USFWS 2002).

4.32.4 NATIONAL HISTORIC PRESERVATION ACT of 1966, as amended.

Based on research conducted by the Corps' archeologist, significant historic properties are not likely to be located within the proposed change of maintenance project area. Historic properties eligible for inclusion in the National Register of Historic Places are located adjacent to the project area but would not be affected. The no adverse effect was made, and consultation with the SHPO was conducted for the Section 1135 Environmental Restoration Project, according to the guidelines established in 36 CFR Part 800 and in compliance with Section 106 of the National Historic Preservation Act, as amended. The SHPO no effect determination has been received for the work proposed on Peanut Island and the recommended disposal alternative.

4.32.5 CLEAN WATER ACT of 1972, as amended.

This project is in full compliance with the existing water quality requirements. Water quality certification (Section 401) is not required for the offloading of dredged material from Peanut Island. Other aspects of the project have received water quality certification under the Section 1135, Peanut Island Environmental Restoration proposal or under the permits authorizing maintenance dredging of Palm Beach Harbor. Water quality certification has also been received for disposal proposed at the dredged hole adjacent to the LWMGC. (see Appendix E – Other Actions on Peanut Island).

4.32.6 CLEAN AIR ACT of 1972, as amended.

No permits would be required for this project. This project is in full compliance with the Act. This Environmental Assessment would be forwarded to EPA's Environmental Policy Section for their review. The EPA did no object to the project or the preparation of an environmental assessment instead of a more comprehensive environmental statement format.

4.32.7 COASTAL ZONE MANAGEMENT ACT of 1972, as amended.

This project is in compliance with this act. See Appendix B for the Coastal Zone Consistency Statement.

4.32.8 FARMLAND PROTECTION POLICY ACT of 1981.

This act is not applicable to the proposed environmental restoration project.

4.32.9 WILD AND SCENIC RIVER ACT of 1968, as amended.

This act is not applicable to the proposed change of maintenance operations project.

4.32.10 MARINE MAMMAL PROTECTION ACT of 1972, as amended.

The customary safeguards to ensure protection of threatened and endangered species such as sea turtles and manatees will be implemented within the construction contract.

4.32.11 ESTUARY PROTECTION ACT of 1968.

No designated estuary would be affected by the proposed change of maintenance operations project activities. This Act is not applicable.

4.32.12 E.O. 11999, PROTECTION OF WETLANDS.

Wetlands would not be adversely affected by the proposed change in maintenance operations project but could be enhanced by the least cost disposal alternative, therefore, this project is in compliance with the Executive Order.

4.32.13 E.O. 11988, FLOODPLAIN MANAGEMENT.

No activities associated with this project adversely impact a floodplain.

4.32.14 E.O. 12898, ENVIRONMENTAL JUSTICE.

No adverse impacts to human health or the environment are anticipated as result of the proposed project. Impacts to "subsistence consumption of fish and wildlife resources" are not anticipated as a result of the proposed project.

4.32.15 E.O. 13089, CORAL REEF PROTECTION.

Those species, habitats, and other natural resources associated with coral reefs would not be adversely affected by the proposed project.

4.32.16 E.O. 13112, INVASIVE SPECIES.

The proposed change of maintenance operations project at Port of Palm Beach and Peanut Island would include the rehabilitation of some of the dike areas. This would provide an opportunity to remove some of the existing exotic tree species (Casuarina spp, Australian Pine) currently growing within the Port of Palm Beach DMSA site. The Federal project is not authorizing, funding, or carrying out actions that might spread or introduce invasive species. All feasible and prudent measures to minimize risk of introducing invasive species would be followed. The contractor, however, would be required to obtain the necessary State permit in accordance with Chapters 62C-20 or 62C-54, F.A.C, as required for the transporting and disposal of prohibited or noxious aquatic plants. Australian Pine is listed by the State of Florida as a Class I Prohibited Aquatic Plants. The Corps initiated research of the State's Invasive Species Management Plan to determine the recommended remove of the existing exotic species. The State recommended method of removal would be required of the contractor and included in the project's plans and specifications. Herbicidal agents that may be applied to eradicate the existing invasive exotic species would be appropriately used with all cuttings transported and disposed of in an approved location.

4.32.17 FEDERAL WATER PROJECT RECREATION ACT.

The principles of the Federal Water Project Recreation Act, (Public Law 89-72) as amended, are not applicable to the proposed change in maintenance operations project as no recreation component is proposed.

4.32.18 FISHERY CONSERVATION AND MANAGEMENT ACT of 1976.

The project has been coordinated with the National Marine Fisheries Service (NMFS) with conservation recommendations (CR) received for the project. The Corps implementation of the CRs would be accomplish when and where practicable.

4.32.19 SUBMERGED LANDS ACT of 1953.

The proposed change of maintenance operations project would not affect submerged State lands. The disposal of the excavated material from Port of Palm Beach DMSA into an anoxic hole adjacent to the Lake Worth Golf Course shoreline would improve benthic resources within that area. The local sponsor would acquire the necessary real estate easements for this work. The Corps would apply for water quality certificate to undertake the work.

4.32.20 RIVERS AND HARBORS ACT of 1899.

The proposed work would not obstruct navigable waters of the United States. The proposed action has been subject to the public notice process subject to the Act. The proposed project is in full compliance.

4.32.21 ANADROMOUS FISH CONSERVATION ACT.

Anadromous fish species would not be affected. The project has been coordinated with the National Marine Fisheries Service and is in compliance with the Act.

4.32.22 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT.

No migratory birds would be affected by the proposed project activities. The project is in full compliance with these acts.

4.32.23 MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT.

The term 'dumping' as defined in Act (33 U.S.C. 1402)(f) does not apply to the placement of the excavated material from Peanut Island. The excavated material would be placed to raise the benthic elevation and to provide a substrate for the recruitment of seagrass, in addition to shoreline plantings of mangroves and spartina. Therefore, the Act does not apply to the proposed project. The disposal activities addressed in this EA would be evaluated under Section 404 of the Clean Water Act.

4.32.24 MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT.

This act requires preparation of an Essential Fish Habitat (EFH) Assessment and coordination with the National Marine Fisheries Service (NMFS). EFH coordination with NMFS has been completed with this EA coordination. The 0.25 acre of impacts proposed to Johnson seagrass would not occur from this proposed action. NMFS comments objecting to the project's potential to adverse impact Johnson seagrass have not been resolved. The Corps shall partner with Palm Beach County to monitoring the mitigation site adjacent the municipal golf course. It is also the Corps' intent to use mitigation credits from this area to mitigation any future impacts to submerged marine resources.

5.0 LIST OF PREPARERS AND REVIEWERS

5.1 PREPARERS.

Paul Stevenson, RLA, Environmental Protection Specialist, Planning Division, Corps
Lou Novak, Civil Engineer, Construction Operations, Corps
Tim Murphy, Project & Programs Management Division, Corps
Catherine L. Brooks, Biologist, Planning Division, Corps

5.2 REVIEWERS.

Kenneth Dugger, Chief Reviewer, Planning Division, Corps
Dorothy Boardman (Legal Counsel) Legal Sufficiency Review, Corps
John Pax (Legal Counsel) Legal Review, Corps

6.0 COORDINATION AND PUBLIC INVOLVEMENT.

6.1 SCOPING.

The proposed action is proposed for coordinated with the appropriate Federal, State and local agencies and individuals. A public notice letter would be sent out following the EA coordination. No substantive comments are anticipated. The proposed action would be coordinated with the State Historic Preservation Officer in compliance with the National Historic Preservation Act of 1966, as amended, and the U.S. Fish and Wildlife Service under the Endangered Species Act

and Fish and Wildlife Coordination Act. In the Fish and Wildlife Coordination Act Report dated November 18, 1997, the USFWS concurred with the Corps finding of no adverse impacts to threatened or endangered species.

6.2 AGENCY COORDINATION.

The proposed change in maintenance operations at Port of Palm Beach and Peanut Island, Palm Beach County, Florida is being coordinated with the appropriate natural resource agencies. The recommended directives that apply to the protection of Federally listed threatened and endangered species would be observed to ensure all adverse affects to resources within the project area are avoided, minimized, or mitigated. We are coordinating with the Florida State Clearinghouse for concurrence with our Coastal Zone Consistency Determination (Appendix B). We are coordinating with the Florida State Historic Preservation Officer concerning our determination of no effect on eligible historic resources.

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APPENDIX A - SECTION 404 (B) EVALUATION

**SECTION 404 (b) EVALUATION REPORT
CHANGE OF MAINTENANCE OPERATIONS
AT PALM BEACH HARBOR AND PEANUT ISLAND
PEANUT ISLAND. PALM BEACH COUNTY, FLORIDA**

I. Project Description.

a. Location. Peanut Island is a 79-acre island created from dredged material placement over some time. It is located in Palm Beach, Section 15, Township 42 South, Range 43 East, Palm Beach County, Florida (Figure 1). Peanut Island is within the Lake Worth Lagoon Estuary, north of the Lake Worth Inlet Federal Channel and Turning Basin, 150 feet east of the Intracoastal Waterway, 1,500 feet west of Lake Worth Inlet. The Palm Beach Harbor is 600 feet east-southeast of the Peanut Island. Rivera Beach and Palm Beach Shores and Singer Island are the landmasses that flank Peanut Island to the west and east respectively.

b. General Description. The purpose of this project is to change the Palm Beach Harbor maintenance dredging operations from winter hopper dredging to summer pipeline dredging. Removal of dredged material from the Palm Beach Harbor Dredged Material Storage Area (DMSA) on Peanut Island to a depth of 4 feet MLW will also take place. Dike rehabilitation construction work will improve the existing dikes and construct new dikes to a height of 32 feet above MLW. This project will provide additional dredged material disposal area for future dredging operations at the Palm Beach Harbor in a very cost-effective manner.

c. Authority and Purpose. Authority for this project is covered by the 1996 Water Resources Development Act, as amended. The purpose of the authority is to maintain the existing project depths of the Palm Beach Harbor to the congressionally approved depths in the public interest.

d. General Description of Dredged or Fill Material. The proposed project will dredge the Palm Beach Harbor to the authorized depth during the summer season with a pipeline dredge. Placement of the dredged material into the existing Palm Beach Harbor DMSA on the southwest end of Peanut Island will occur after it has been offloaded and dikes rehabilitated. Roughly 600,000 cubic yards of dredged material currently within the Palm Beach Harbor DMSA will be dry offloaded on barges and deposited in the anoxic hole adjacent to the City of Lake Worth Municipal Golf Course and the IWW to the south of C-51. The material excavated from the maintenance dredging of the Palm Beach Harbor will consist of sandy material with some shell and rock. The project does not involve any extra areas of fill and the work will not result in any long term increases in turbidity.

e. Description of the Proposed Discharge Site. The dredged material removed from the Palm Beach Harbor will be dumped in the Palm Beach Harbor DMSA on Peanut Island after it has been offloaded and dikes rehabilitated. All recognized Best Management Practices (BMPs) applicable to project construction will be considered to ensure compliance with water quality certificate parameters before construction begins. Standard turbidity controls will be utilized during the project construction.

II. Factual Determinations.

a. Water Circulation, Fluctuation and Salinity Determination. Lake Worth is a tidal lagoon subject to tidal influence and freshwater inflows. Tidal waters enter the lagoon through the Lake Worth Inlet. Tides are semi-diurnal with a tidal fluctuation of every twelve hours during the tidal cycle. Salinity in the Lake Worth area ranges from 28.3 to 35.8 parts per thousand. The Florida Department of Environmental Protection (FDEP) maintains a tide gauge adjacent to the Lake Worth Inlet less than half a mile away from the proposed change of maintenance operations project.

b. Suspended Particulate/Turbidity Determinations. A temporary short-term increase in suspended particulates could occur in the water column during project construction. Once the excavated material has been removed from the harbor and settlement occurs, no significant long-term increase in turbidity is anticipated. Turbidity BMPs will be undertaken by the Federal contractor during the maintenance dredging of Palm Beach Harbor. The dry offloading of the material within Palm Beach Harbor DMSA and its disposal into the anoxic hole adjacent to the City of Lake Worth Municipal Golf Course should not pose a turbidity problem. Standard turbidity controls will be utilized during construction.

c. Contaminant Determinations. No toxic materials are a part of the materials to be removed from Peanut Island. Excavated soils will be placed in an upland placement area on Peanut Island. BMPs will be implemented by the contractor to prevent high levels of turbidity in the water column during project construction.

d. Aquatic Ecosystem and Organism Determinations. No long term adverse impacts on autotrophic and heterotrophic organisms are anticipated. No adverse impacts on motile invertebrates are anticipated. No adverse impacts are expected on nekton organisms. The placement of the dry dredged material from the Port of Palm Beach DMSA is anticipated to raise the bottom elevations of the anoxic hole to a more productive benthic habitat.

e. Proposed Placement Site Determinations. The Port of Palm Beach dredged material will be placed in the Port of Palm Beach DMSA on Peanut Island. There are no adverse impacts anticipated to the project area resources as a result of the port dredging and placement of dredged material within the existing Palm Beach Harbor DMSA. The disposal of dry dredged material from the Palm Beach Harbor DMSA into the anoxic hole adjacent to the City of Lake Worth Municipal Golf Course and the IWW is not anticipated to adversely affect site specific or area natural resources. Standard turbidity controls will be utilized during construction.

f. Determination of Cumulative Effects on the Aquatic Ecosystem. The proposed project will not cause or contribute to violations of State Water Quality Standards, jeopardize the existence of any endangered or threatened species or impact a marine sanctuary. No significant degradation is expected and all appropriate and practicable steps will be taken to minimize impacts. No adverse affects to Federally listed threatened of endangered species will occur.

III. Findings of Compliance or Non-Compliance with the Restrictions on Discharge.

1. No significant adaptations of the Section 404 (b) guidelines were made relative to this evaluation.
2. There would be no discharge of toxic fill material in the project area. Therefore, the project complies with Section 307 of the Clean Water Act.
3. There would be no adverse impacts on the water supply of surrounding communities in the Lake Worth area from the implementation of this project.
4. There will be no direct or indirect adverse impact on any threatened or endangered organism from the implementation of this project (manatees or seagrass)
5. There should be no significant long-term adverse impact on any autotrophic organism from the implementation of the selected plan.
6. There should be no direct or indirect adverse impact on highly motile organisms such as fish and crustaceans.
7. No long-term significant direct or indirect adverse impacts are anticipated on non-motile infaunal organisms or motile epifaunal organisms in the immediate project area from the proposed project.
8. No significant adverse impacts are anticipated on terrestrial wildlife in the immediate project area.
9. Implementing the project poses no threat to juvenile fish or wildlife dependant upon the immediate project area for their subsistence.
10. No significant or long-term change in the biodiversity of the communities is anticipated due to the project construction.
11. On the basis of the guidelines, the proposed placement site for the discharge of fill material is specified as complying with the requirements of the Clean Water Act.

APPENDIX B - FLORIDA COASTAL ZONE MANAGEMENT CONSISTENCY

**FLORIDA COASTAL ZONE MANAGEMENT CONSISTENCY
FEDERAL CONSISTENCY EVALUATION PROCEDURE**

**CHANGE OF MAINTENANCE OPERATIONS
AT PALM BEACH HARBOR AND PEANUT ISLAND
PEANUT ISLAND. PALM BEACH COUNTY, FLORIDA**

1. Chapter 161, Beach and Shore Protection. The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and which might have an effect on natural shoreline processes.

Consistency Statement: The purpose of the proposed action is to change the maintenance operations at the Palm Beach Harbor from winter hopper dredging to summer pipeline dredging. The Palm Beach Harbor Dredge Material Storage Area (DMSA) would be dry offloaded to provide additional upland dredged material storage capacity in close proximity to the port. The dredged material offloaded from Peanut Island (approximately 600,000 CY) would be placed in an anoxic hole adjacent to the City of Lake Worth Municipal Golf Course and the IWW (least cost disposal alternative). The island would continue to function as a dredged material placement area, historic properties setting, Coast Guard post, and recreation resource. Information has been submitted to the State of Florida, Department of Environmental Protection (DEP) for a permit in compliance with this chapter. All structures needed for the project would be removed from the island, at completion of the proposed work.

2. Chapters 186 and 187, State and Regional Planning: These chapters establish the State Comprehensive Plan that sets goals to articulate a strategic vision for the State of Florida's future. The purpose is to define in a broad sense, goals and policies that provide decision-makers directions for the future and long-range guidance for orderly social, economic and physical growth.

Consistency Statement: The proposed project would comply with the strategic vision of the State of Florida as mentioned in the State and Regional Planning Chapters.

3. Chapter 252, Disaster Preparation, Response and Mitigation: This chapter creates a State Emergency Management Agency, with authority to provide for the common defense; to protect the public peace, health and safety; and to protect and preserve the lives and property of the people of Florida.

Consistency Statement: The proposed change in maintenance operations, from winter hopper dredging to summer pipeline dredging, and the dry offloading of the Palm Beach Harbor DMSA would not jeopardize the public health, safety or welfare but could help to enhance the chapter's goals. The preferred alternative disposal site would raise the benthic elevations in the area to more suitable grades to support the recruitment of seagrass and other benthic species. Therefore, this work would be consistent with the intent of this chapter.

4. Chapter 253, State Lands: This chapter governs the management of submerged State lands and resources within these lands. This includes archeological and historical resources; water resources; fish and wildlife resources; beaches and dunes; submerged grass beds and other benthic communities; swamps, marshes and other wetlands, mineral resources; unique natural features; submerged lands; placement islands, and artificial reefs.

Consistency Statement: The proposed change in maintenance operations (from winter hopper dredging to summer pipeline dredging and the dry offloading of the Palm Beach Harbor DMSA) would help to provide habitat for fisheries and wildlife. The summer pipeline maintenance dredging of Palm Beach Harbor would not adversely effect benthic resources discussed in this chapter. Dry offloading the dredged material within the Palm Beach Harbor DMSA would not adversely affect benthic resources. The disposal of the offloaded dredged material to the anoxic hole adjacent to the City of Lake Worth Municipal Golf Course and the IWW (least cost alternative) would raise the benthic elevations for the potential recruitment of seagrass and other benthic organisms. The use of State lands for restoration objectives has been previously been approved by the State. The proposed activity has been coordinated with or in the process of coordination with the State and appropriate permits would be obtained. The proposed action complies with the intent of this chapter.

5. Chapters 253, 259, 260 and 375, Land Acquisition. These chapters authorize the State to acquire land to protect environmentally sensitive areas.

Consistency Statement: The proposed change in maintenance operations and associated work would not adversely affect the State's acquisition and protection of environmentally sensitive lands. These chapters do not apply.

6. Chapter 258, State Parks and Aquatic Preserves: This chapter authorizes the State to manage State parks and preserves. Consistency with this chapter would include consideration of projects that would directly or indirectly adversely impact park property, natural resources, park programs or their management or operations.

Consistency Statement: The proposed action would not adversely affect State parks or preserves, and is consistent with the intent of this chapter.

7. Chapter 267, Historic Preservation. This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

Consistency Statement: The proposed work (change in maintenance operations and offloading of material from Peanut Island) has been coordinated with the State Historic Preservation Officer (SHPO). The work would be consistent with the goals of this chapter. Disposal of offloaded material adjacent to the City of Lake Worth Municipal Golf Course is currently being coordinated. It is anticipated this work would be the existing goals. A "no effect" has been previously issued by SHPO for disposal proposed at this located that's associated with Johns Island and Peanut Island environmental restoration projects.

8. Chapter 288, Economic Development and Tourism. This chapter directs the State to provide guidance and promotion of beneficial development through the encouragement of economic diversification and promotion of tourism.

Consistency Statement: The change in maintenance operations at Palm Beach Harbor and Peanut Island could temporarily affect recreational boaters within the project area. The potential temporary effect would end once the project work vessels and equipment are removed from the area. Therefore, the work is consistent with the goals of this chapter.

9. Chapter 334 and 339, Public Transportation. This chapter authorizes the planning and development of a safe and efficient public transportation system.

Consistency Statement: The proposed action would not affect public transportation. Therefore, this chapter does not apply.

10. Chapter 370, Living Saltwater Resources. This chapter directs the State to preserve, manage and protect marine crustacean, shell and anadromous fishery resources in State waters; to protect and enhance the marine and estuarine environment; to regulate fishermen and vessels of the state engaged in the taking of such resources within or without state waters; to issue licenses for the taking and processing of fishery products; to secure and maintain statistical records of the catch of each such species; and to conduct scientific, economic and other studies and research.

Consistency Statement: The proposed change in maintenance operations would not adversely affect such activities and is consistent with the goals of this chapter. The disposal of the dredged material dry offloaded from the Palm Beach Harbor DMSA on Peanut Island within the anoxic hole adjacent to the City of Lake Worth Municipal Golf Course (least cost disposal alternative) would raise the benthic elevations and potentially recruit seagrass and other benthic submerged aquatic resources.

11. Chapter 372, Living Land and Freshwater Resources. This chapter establishes the Game and Fish Conservation Commission and directs it to manage freshwater aquatic life and wild animal life and their habitat to perpetuate a diversity of species with densities and distributions that provide sustainable ecological, recreational, educational, scientific, aesthetic and economic benefits.

Consistency Statement: The proposed change in maintenance operations would not include work in freshwater habitat. The proposed change in maintenance operations would not adversely affect aquatic life or wildlife or their habitat. The work would comply with the goals of this chapter.

12. Chapter 373, Water Resources. This chapter provides the authority to regulate the withdrawal, diversion, storage and consumption of water.

Consistency Statement: The proposed work does not involve water resources as described by this chapter.

13. Chapter 376, Pollutant Spill Prevention and Control. This chapter regulates the transfer, storage and transportation of pollutants and the cleanup of pollutant discharges.

Consistency Statement: The proposed work does not involve the transportation or discharge of pollutants. Conditions would be placed in the project's contract to ensure safe handling procedures are in place should any inadvertent spills of pollutants such as fuels occur. The proposed work would conform with the intent of this chapter.

14. Chapter 377, Oil and Gas Exploration and Production. This chapter authorizes the regulation of all phases of exploration, drilling and production of oil, gas and other petroleum products.

Consistency Statement: The proposed action does not involve the exploration, drilling or production of oil, gas or other petroleum products and therefore does not apply.

15. Chapter 380, Environmental Land and Water Management. This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact of large-scale development.

Consistency Statement: The proposed action has been coordinated with the local regional planning council and the work conforms to the goals of this chapter.

16. Chapter 388, Arthropod Control. This chapter provides for a comprehensive approach for abatement or suppression of mosquitoes and other arthropod pests within the state.

Consistency Statement: The proposed action would be consistent with the goals of this chapter.

17. Chapter 403, Environmental Control. This chapter authorizes the regulation of pollution of the air and waters of the state by the Department of Environmental Protection.

Consistency Statement: Appropriate State permits would be obtained for the project. The proposed project would be consistent with the chapter goals.

18. Chapter 582, Soil and Water Conservation. This chapter establishes policy for the conservation of State soils and water through the Department of Agriculture. Land use policies would be evaluated in terms of their tendency to cause or contribute to soil erosion or to conserve, develop and utilize soil and water resources both on-site or on adjoining properties affected by the work. Particular attention would be given to work on or near agricultural lands.

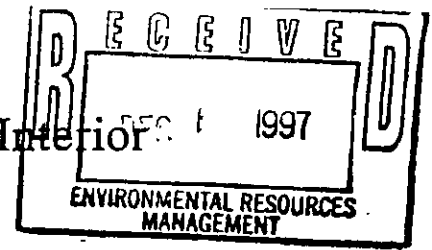
Consistency Statement: The proposed work is not located near agricultural lands; therefore, this chapter does not apply.

APPENDIX C - PERTINENT CORRESPONDENCE



United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecosystem Office
P.O. Box 2676
Vero Beach, Florida 32961-2676



November 18, 1997

Dennis R. Duke, Acting Chief
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Attn: Planning Division

FWS Log No.: 4-1-98-I-237
1135 Project: Peanut Island
County: Palm Beach

Dear Mr. Duke:

The U.S. Fish and Wildlife Service (FWS) has reviewed the U.S. Army Corps of Engineers' (COE) restoration plan for Peanut Island under Section 1135 of the Water Resources Development Act of 1992. This letter represents the FWS' opinion on the effects of the proposed action in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA) and with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*). We have assigned FWS Log Number 4-1-98-I-237 to this consultation.

PROJECT DESCRIPTION

Originally a shallow water area, Peanut Island was created in 1918 as a result of material excavated from creating Lake Worth Inlet. Since 1934, the COE has used the island as a deposition site for material dredged from Lake Worth Inlet and the Atlantic Intracoastal Waterway. As a result of these numerous dredging efforts, a 79-acre island was formed and subsequently vegetated with exotic plants such as Australian pines (*Casuarina equisetifolia*). The island is located adjacent to the inlet in Lake Worth Lagoon, Palm Beach County, Florida.

In 1994, Palm Beach County, the Port of Palm Beach, and the Florida Inland Navigation District proposed to restore Peanut Island by removing exotic vegetation, enhancing native plant communities, and improving the island's passive recreational opportunities. In 1996, Palm Beach County requested the COE's assistance (through the Section 1135 Program) to restore Peanut Island, thereby providing these benefits. The restoration proposal consists of three components: (1) creating 9.1 acres of maritime hammock, (2) enhancing 3.5 acres of intertidal mangroves, and (3) creating one acre of shallow water hardbottom habitat. Though not an objective under Section 1135, the restoration proposal will also result in providing some limited passive recreational benefits. The details for each restoration component are as follows:

1. **Maritime hammock**

Two maritime hammocks, totaling 9.1 acres, are proposed on the east and west sides of the island. The proposed actions include clearing and chipping exotic vegetation followed by replanting with native vegetation.

2. **Mangrove wetlands**

Two isolated mangrove areas, totaling 3.5 acres along the west side of the island, are proposed to be hydrologically reconnected to the lagoon. The proposed action consists of excavating approximately 3,000 feet of channel to tidally flush the mangrove areas.

3. **Shallow water reef**

This one acre site is located along the southeast corner of the island. The proposed actions include (a) the excavation of approximately 24,000 cubic yards of material to create a basin with a depth of -10 feet NGVD and (b) the placement of approximately 4,800 tons of limestone boulders to create the reef complex. The transitional zone created between the basin and the adjacent uplands will be resloped and stabilized with native vegetation.

THREATENED AND ENDANGERED SPECIES

We have reviewed the information in the restoration plan as well as information available to us on the presence of threatened and endangered species and designated critical habitat in the vicinity of the project site. Based on our review, the West Indian manatee (*Trichechus manatus*) as well as threatened and endangered sea turtles are present in and around Lake Worth Lagoon.

West Indian manatee

Our records indicate that the endangered West Indian manatee is present year-round in Lake Worth Lagoon. Furthermore, the lagoon is designated critical habitat for the manatee (50 CFR 17.95). The COE did not determine if the proposed action will have an effect on the manatee or its designated critical habitat. The restoration plan indicates some work is occurring below the mean low water line; therefore, we have determined a "may affect" for the manatee.

In a phone conversation with Kalani Cairns (FWS biologist) on November 4, 1997, Paul Stevenson (COE Project Manager) indicated that prior to the commencement of any operational activities associated with this project, the COE would implement the standard manatee construction precautions. Based on the COE's willingness to comply with these protective measures, we conclude that the restoration plan for Peanut Island is not likely to adversely affect the manatee nor is it likely to adversely modify or destroy its designated critical habitat.

Sea turtles

The proposed restoration project is located within the nesting ranges of the threatened loggerhead sea turtle (*Caretta caretta*) as well as the endangered green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), and hawksbill sea turtle (*Eretmochelys imbricata*). Again, the COE did not determine if the proposed action will have an effect on these

species. Since the restoration plan indicates work is occurring below the mean low water line, we have determined a "may affect" for listed sea turtles. However, based on the nature of the proposed work, we conclude that the restoration plan for Peanut Island is not likely to adversely affect threatened and endangered sea turtles. Currently, there is no critical habitat designated for the sea turtles listed above; therefore, none will be affected.

Although this does not constitute a Biological Opinion described under section 7 of the ESA, it does fulfill the requirements of the ESA, and no further action is required. If modifications are made to the project or if additional information involving potential effects on listed species becomes available, reinitiation of consultation may be necessary.

FISH AND WILDLIFE RESOURCES

Fish and wildlife resources have been previously documented by Palm Beach County and summarized by the COE in the restoration plan for Peanut Island. Hence, it is unnecessary to present this same information on these resources within this letter. Instead, the discussion should focus on the expected benefits associated with this restoration effort. The purpose of the restoration plan is to create and enhance habitat for fisheries and wildlife. For each of the components, the anticipated environmental benefits are as follows:

1. Shallow water reef

Due to its close proximity to Lake Worth Inlet, the shallow water reef will provide substrate for oceanic larvae to settle and grow as well as offer excellent habitat for a wide range of fish species.

2. Mangrove wetlands

The creation of flushing channels will reconnect the isolated mangrove areas to the lagoon. Hence, the mangrove areas will be tidally flushed with clearer oceanic water, thereby providing habitat and water quality conditions preferred by nearshore reef fish species.

3. Maritime hammock

The creation of a maritime hammock will provide food and shelter for migratory birds and other wildlife. As background, tremendous development pressure throughout South Florida has created a multitude of ecosystem problems. Increased human habitation has increased additional development of coastal uplands, which has led to an increase in invasive exotic flora and fauna. The concurrent loss of habitat has resulted in declining numbers of neotropical migratory avifauna. This assemblage of birds utilizes a wide variety of habitats extending throughout North, Central, and South America. Habitat loss and fragmentation have affected their survival and propagation. An additional and significant concern is the loss of refueling depots, areas where these birds have historically paused in their journeys to feed and rest. Maritime hammocks are a very unique and important biological resource. Creating over nine acres of maritime hammock will promote natural ecological functions to occur and increase biodiversity in an area with a diminishing coastal ecosystem. An additional ecological benefit includes the enhancement of upland habitat by creating the native plant species diversity upon which neotropical migrants depend. For instance, the

coastal spoil islands in the Indian River Lagoon have provided unique opportunities for creating appropriate forage habitat for migratory birds.

SUMMARY AND RECOMMENDATIONS

In summary, Palm Beach County and the COE are cooperating under Section 1135 to restore Peanut Island. The FWS supports the proposed restoration plan for Peanut Island. We believe the restoration proposal qualifies for partial funding support from the FWS' South Florida Coastal Ecosystem Program (SFCEP). The primary objective of the SFCEP is to identify opportunities to protect, conserve, and restore coastal living resources. We accomplish this by actively forming partnerships with other federal and state agencies, local governments, non-governmental entities, and private property owners to implement "on-the-ground" restoration projects as well as to perform research, monitoring, and public outreach activities. Thus, we could participate in the creation of the maritime hammock with funding assistance from the SFCEP.

Once again, we are available to coordinate with you on this project as it continues to develop. Thank you for your interest in the effort to protect, conserve, and restore coastal living resources. If you have any questions, please contact Mr. Cairns of our office at (561) 562-3909.

Sincerely,

Kalani Cairns

for James J. Slack
Project Leader
South Florida Field Office

cc:

NMFS, Miami, FL

GFC, Vero Beach, FL

DEP, Tallahassee, FL

✓ Palm Beach County, West Palm Beach, FL

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES
AND CANDIDATE SPECIES FOR FEDERAL LISTING
IN PALM BEACH COUNTY

Scientific Name	Common Name	Status
Amphibians and Reptiles		
<i>Alligator mississippiensis</i>	American alligator	T (S/A)
<i>Caretta caretta</i>	Loggerhead sea turtle	T
<i>Chelonia mydas</i>	Green sea turtle	E
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E
<i>Drymarchon corais couperi</i>	Eastern indigo snake	T
<i>Eretmochelys imbricata</i>	Hawksbill sea turtle	E
<i>Lepidochelys kempii</i>	Kemp's (=Atlantic) ridley sea turtle	E
Birds		
<i>Aphelocoma coerulescens</i>	Florida scrub-jay	T
<i>Campephilus principalis</i> (probably extinct in south Florida)	Ivory-billed woodpecker	E
<i>Charadrius melodus</i>	Piping plover	T
<i>Dendroica kirtlandii</i>	Kirtland's warbler	E
<i>Haliaeetus leucocephalus</i>	Bald eagle	T
<i>Mycteria americana</i>	Wood stork	E
<i>Picoides borealis</i>	Red-cockaded woodpecker	E
<i>Polyborus plancus audubonii</i>	Audubon's crested caracara	T
<i>Rostrhamus sociabilis plumbeus</i>	Everglade snail kite	E*
<i>Sterna dougalli dougalli</i>	Roseate tern	T
<i>Vermivora bachmanii</i>	Bachman's warbler	E
Mammals		
<i>Felis concolor</i>	Mountain lion	T (S/A)
<i>Felis concolor coryi</i>	Florida panther	E
<i>Trichechus manatus latirostris</i>	West Indian manatee	E*
<i>Ursus americanus floridanus</i>	Florida black bear	C
Plants		
Family Annonaceae		
<i>Asimina tetramera</i>	Four-petal pawpaw	E
Family Convolvulaceae		
<i>Jacquemontia reclinata</i>	Beach jacquemontia	E
Family Cucurbitaceae		
<i>Cucurbita okeechobeensis</i>	Okeechobee gourd	E

* Critical habitat has been designated for this species in this county.

Scientific Name	Common Name	Status
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Plants (continued)

Family Polygalaceae

Polygala smalli

Tiny polygala

E

* Critical habitat has been designated for this species in this county.

Palm Beach County

revised 1/15/97



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, Florida 33702

January 29, 1999

Colonel Joe R. Miller, District Engineer
Jacksonville District Corps of Engineers
Planning Division, Environmental Branch
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Miller:

The National Marine Fisheries Service (NMFS) has reviewed the Environmental Assessment as requested by your staff, in a letter dated December 21, 1998, regarding the Section 1135 Environmental Restoration Report for Peanut Island located near the Lake Worth Inlet in Palm Beach County, Florida.

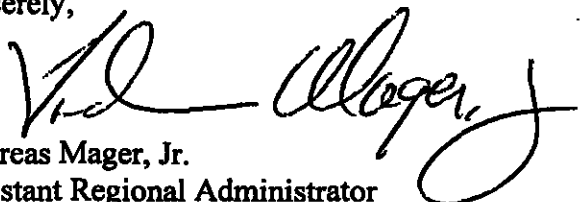
The proposed action would improve fish and wildlife habitats located on Peanut Island which is a 79-acre man-made dredged material disposal island. Specifically, a one-acre lagoon, a 7.7-acre maritime hammock, and 2.2 acres of transitional wetlands would be created from portions of the existing island. Additionally, a one-acre reef will be constructed adjacent to the island and three acres of existing mangroves will be reconnected to the Lake Worth Lagoon through a series of inlets, tidal ponds, and channels. The selected alternative takes into full consideration the existing habitats, on and near the island, while maintaining existing disposal capability and cultural resources.

Based on our review, the subject document adequately identifies the living marine resources of the project area and accurately describes the probable affects on those resources. However, we note several discrepancies that should be addressed before the report is finalized. Sections 4.2.1c (page 15) and 4.5.4 (page 35) should be revised to reflect that the NMFS listed *Halophila johnsonii* (Johnson's seagrass), effective October 14, 1998, as a threatened species. Additionally, Section 9.2 (page 48) indicates that lists of threatened and endangered species have been received from and coordinated has been completed with both the U.S. Fish and Wildlife Service(FWS) and the NMFS in accordance with the Endangered Species Act (ESA). However, we note that Appendix C contains correspondence only from the FWS pertaining to ESA consultation. We recommend that you contact our Protected Resources Division to ensure full compliance with the ESA. They may be contacted at 727/570-5312.



The Habitat Conservation Division of the NMFS supports this restoration effort and believe the project will have a positive impact on living marine resources. If we can be of further assistance, please advise. Related comments, questions or correspondence should be directed to Mr. David N. Dale in St. Petersburg, Florida. He may be contacted at 727/570-5311 or at the letterhead address above.

Sincerely,



Andreas Mager, Jr.
Assistant Regional Administrator
Habitat Conservation Division



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

February 26, 1998

Department of the Army, Corps of Engineers
Mr. John R. Hall, Acting Chief
Planning Division
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Hall:

The National Marine Fisheries Service (NMFS) has reviewed your notice of intent dated January 27, 1998, regarding the Corps of Engineers proposal to prepare an environmental assessment for the environmental restoration of Peanut Island in Lake Worth, Palm Beach County, Florida.

The proposed restoration project includes constructing of a 9.1 acre maritime hammock, removing exotic vegetation, excavating tidal channels for the establishment of 3.5 acres of mangrove habitat, and constructing of a 1.0 acre shallow water reef habitat. The NMFS supports this restoration effort and believes the project will have a positive impact to living marine resources.

A NMFS ecologist conducted an on-site inspection of the project site. The project site is excellent in terms of fishery recruitment potential and water quality because it is located at the Lake Worth Inlet. The project design should maximize this potential by providing as much tidally influenced habitat as possible, perhaps increasing the mangrove or tidal creek habitats. Also, there is possibility that the proposed tidal creeks may recruit and support seagrasses. Therefore, any project modifications that would result in additional seagrass habitat are desirable.

We appreciate the opportunity to provide comments on the project and look forward to the draft environmental assessment when it becomes available. If there are questions regarding these comments please contact Mr. John Iliff of our Panama City Office in Miami at 305/595-8352.

Sincerely,

Andreas Mager, Jr.
Assistant Regional Administrator
Habitat Conservation Division





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, Florida 33702

January 29, 1999

Colonel Joe R. Miller, District Engineer
Jacksonville District Corps of Engineers
Planning Division, Environmental Branch
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Miller:

The National Marine Fisheries Service (NMFS) has reviewed the Environmental Assessment as requested by your staff, in a letter dated December 21, 1998, regarding the Section 1135 Environmental Restoration Report for Peanut Island located near the Lake Worth Inlet in Palm Beach County, Florida.

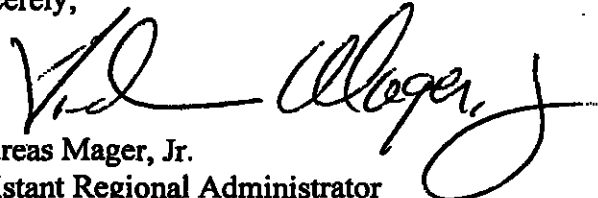
The proposed action would improve fish and wildlife habitats located on Peanut Island which is a 79-acre man-made dredged material disposal island. Specifically, a one-acre lagoon, a 7.7-acre maritime hammock, and 2.2 acres of transitional wetlands would be created from portions of the existing island. Additionally, a one-acre reef will be constructed adjacent to the island and three acres of existing mangroves will be reconnected to the Lake Worth Lagoon through a series of inlets, tidal ponds, and channels. The selected alternative takes into full consideration the existing habitats, on and near the island, while maintaining existing disposal capability and cultural resources.

Based on our review, the subject document adequately identifies the living marine resources of the project area and accurately describes the probable affects on those resources. However, we note several discrepancies that should be addressed before the report is finalized. Sections 4.2.1c (page 15) and 4.5.4 (page 35) should be revised to reflect that the NMFS listed *Halophila johnsonii* (Johnson's seagrass), effective October 14, 1998, as a threatened species. Additionally, Section 9.2 (page 48) indicates that lists of threatened and endangered species have been received from and coordinated has been completed with both the U.S. Fish and Wildlife Service(FWS) and the NMFS in accordance with the Endangered Species Act (ESA). However, we note that Appendix C contains correspondence only from the FWS pertaining to ESA consultation. We recommend that you contact our Protected Resources Division to ensure full compliance with the ESA. They may be contacted at 727/570-5312.



The Habitat Conservation Division of the NMFS supports this restoration effort and believe the project will have a positive impact on living marine resources. If we can be of further assistance, please advise. Related comments, questions or correspondence should be directed to Mr. David N. Dale in St. Petersburg, Florida. He may be contacted at 727/570-5311 or at the letterhead address above.

Sincerely,



Andreas Mager, Jr.
Assistant Regional Administrator
Habitat Conservation Division

FEB 05 1999

Planning Division
Environmental Branch

Mr. Charles Orvetz, Chief
Protected Species Branch
National Marine Fisheries Service
9721 Executive Center Drive N.
St. Petersburg, Florida 33702

Dear Mr. Orvetz:

I am writing you concerning the letter of January 29, 1999 from Mr. Andreas Mager, Jr., of your office (copy enclosed). The letter indicated the U. S. Army Corps of Engineers (Corps) might not be in compliance with the Endangered Species Act for the 1135 Peanut Island Environmental Restoration Project. The reason noted in the letter was due to a lack of coordination and response with the National Marine Fisheries Service, (NMFS) Protected Species Branch.

The seagrass survey in the Draft Environmental Assessment (EA) on page 16 and our recent efforts to survey sea grasses in the vicinity of Palm Beach Harbor (see enclosed Draft Marine Seagrass Survey) indicate that *Halophila* species occur in the vicinity of Peanut Island. Neither surveys distinguish the Johnson Seagrass from other species of *Halophila*. Neither survey enables us to determine exactly how much Johnson Seagrass occurs in the area. The only direct impacts below Mean High Water would be for the construction of the artificial reef component. As shown in Figure 2 of the EA, the reef would be located to avoid any seagrasses.

There may be some indirect impacts to seagrass during construction through increased turbidity and sedimentation. Turbidity and sedimentation will be controlled in accordance with the requirements of the State of Florida Water Quality Certificate. Following project construction, there may be some change in the tidal flushing patterns around the island. We have not been able to determine how much sea grass could be impacted but we do estimate that a net benefit to the environment will be realized by the construction of the project. Therefore we are initiating consultation under Section 7 of the Endangered Species Act for the Johnson Seagrass based on the above information.

Enclosed you will find the Public Notice of January 27, 1998 and the Draft EA for Peanut Island 1135 Environmental Restoration Project. Please review the notice and EA, and provide us with

any comments you may have by the end of February 1999. The Corps' Draft Marine Seagrass Survey for the Intracoastal Waterway in the Vicinity of the Palm Beach Harbor, October 1998 is included for your information.

Direct any questions concerning this letter to Mr. Paul Stevenson of my staff at telephone 904 232-2130 or email address paul.c.stevenson@usace.army.mil. Thank you.

Sincerely,

James C. Duck,
Chief, Planning Division

Enclosures



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5312, FAX 570-5517

MAR - 9 1999

F/SER3:LEB

Mr. James C. Duck
Chief, Planning Division
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Dear Mr. Duck:

This responds to your February 5, 1999 letter to me regarding the Section 1135 Peanut Island Environmental Restoration Project in Lake Worth Lagoon, Palm Beach County, Florida. The purpose of this project is to reestablish historic habitat for fisheries and wildlife by creating wetland and upland habitat on Peanut Island. The project proposes the creation of a 1.0 acre shallow-water reef habitat to -10 feet National Geodetic Vertical Datum (NGVD), by clearing exotic vegetation, excavating dredged material and placing limestone boulders as substrate for reef habitat on the southeast side of the island, and creating an adjacent 1.0 acre shallow-water lagoon to a depth of -5 feet NGVD by removing dredged material. According to your letter, there may be impacts to seagrass, including the Federally-listed threatened Johnson's seagrass, *Halophila johnsonii*. This initiates consultation under section 7 of the Endangered Species Act (ESA).

In order for National Marine Fisheries Service (NMFS) to complete a section 7 consultation, we need complete information regarding the presence and amount of Johnson's seagrass that occurs in the project site and how this species may be affected by the project's actions. The 1.0 acre seagrass bed located at the site of the proposed shallow-water reef habitat on the southeast end of Peanut Island has not been identified by species. In addition, the Draft Marine Seagrass Survey is of little use for this project since it constitutes a survey of the Intracoastal Waterway (ICW) and is not a survey around Peanut Island. Any *Halophila* observed was not identified to species. The shallow shoreline, an area where Johnson's seagrass is known to occur, was not surveyed. The survey occurred in October rather than in the summer, as recommended, when growth and abundance of seagrass are optimal. In addition, a trained surveyor should be able to identify Johnson's seagrass, distinguishing it from other *Halophila* species, with the naked eye. A surveyor could choose to use an underwater magnifier or light, however, taking of samples should not be necessary (particularly during preferred summers surveys) unless water clarity is so poor that it prevents in-water identification.



Lake Worth Lagoon is a significant area for Johnson's seagrass. According to Figure 2, Page 4 of the Environmental Assessment Report, the 1.0 acre of seagrass will not be directly affected by the construction of the artificial reef with the chosen Alternative A. However, the loss of sea floor adjacent to seagrass beds can negatively impact their existence. NMFS Ecologist Mark Fonseca (1998) wrote: "What we have found is that patchy seagrass beds colonize new space and vacate existing, occupied space over time. This is not news, we have simply documented this in seagrass beds of *Halodule wrightii* and *Zostera marina* in North Carolina. Some of this movement is from vegetative propagation (e.g., runners or tillers), some is the result of successful seed colonization, and some is from plant mortality (creation of vacancies). The rate at which this movement occurs depends upon the inherent population growth rate of the species involved, and *Halophila* spp. have some of the highest rates on record (Josselyn *et al.* 1986, Kenworthy *et al.* 1989). So to remove a section of the sea floor among existing patches from future colonization is to prevent existing seagrass, which *must* migrate, from colonizing new areas and maintaining its local overall abundance. Such a removal ultimately deletes a portion of the baseline resource and when represented as a spatial pattern on the sea floor, constitutes a fragmentation of the existing resource."

It is unclear from the information provided whether the new artificial reef structure (fingers) would eliminate open patches of sea floor that allow for the natural future colonization of seagrasses, particularly Johnson's seagrass which is known to rely heavily on vegetative propagation and migration to adjacent open sea floor. The southeast corner of the proposed reef appears to have the most potential of interrupting seagrass growth. NMFS may concur that this project offers a net benefit to the environment but only if it is not eliminating seagrass habitat in the process. A combination of beneficial and adverse effects is still "likely to adversely affect" Johnson's seagrass.

Although you state that the construction of the artificial reef would be located to avoid any seagrasses, you state further in your letter that "there may be some change in the tidal flushing patterns around the island" and "have not been able to determine how much seagrass could be impacted." Page 35, 4.5.4 of the Environmental Restoration Report states that the proposed tidal changes have the potential to recruit *Halophila johnsonii*. NMFS agrees that the creation of shallow-water habitat adjacent to the shallow-water reef *has the potential* for seagrass recruitment and therefore *may* have an eventual beneficial effect upon Johnson's seagrass. However, if recruitment does occur, it cannot be determined with certainty that it would be of Johnson's seagrass.

If Johnson's seagrass does exist in the project area, then the *preliminary assessment* appears to be that this project may affect but not adversely affect Johnson's seagrass. However, a final determination cannot be made, and a section 7 consultation under the ESA can not be concluded, until further information is provided to NMFS, Protected Resources Division on: a) the presence and amount of Johnson's seagrass in the project area, and b) the submerged structure of the proposed shallow-water reef. If Johnson's seagrass does not exist in the project area, a section 7 consultation with this office is not necessary.

NMFS requests the following information:

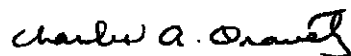
1. Does Johnson's seagrass exist in this 1.0 acre of seagrass? If so, please identify its relative abundance at this site.
2. How much of the sea floor (potential seagrass habitat) will be covered by the new shallow-reef structure? What are the dimensions of the "fingers" that will occur on either side of the seagrass bed? To what maximum depth will they extend? What will be the approximate distance(s) between the reef and seagrass bed? (Figure 2, Page 5, Environmental Restoration Report).
3. Could changes in tidal flushing patterns produce an erosion or deposition of sand on the 1.0 acre seagrass bed or adjacent areas?

In addition, NMFS strongly recommends pre- and post-monitoring for three years of the 1.0 acre seagrass bed and the proposed shallow-water lagoon, regardless of the presence of Johnson's seagrass. Such monitoring could include: species identification and abundance, bed/patch dimensions, seagrass bed location (using GPS to map its boundaries). Changes in the existing seagrass bed would be tracked over time, and the monitoring of the "new" shallow-water lagoon could provide valuable information on the recruitment of seagrass, including Johnson's seagrass, into such an area. This information will be useful to the COE and NMFS when considering future COE permitting requests in areas where *Halophila johnsonii* exists and will facilitate and expedite the permitting process. The COE should develop estimates of annual take of Johnson's (and other) seagrass anticipated by projects within Florida's intracoastal waterways within Johnson's seagrass habitat.

NMFS suggests that the Environmental Restoration Report be amended to include the Federally-listed threatened species under NMFS purview, Johnson's seagrass, *Halophila johnsonii*.

We appreciate the opportunity for initial consultation on this project and look forward to working with you for the conservation of listed species. If you have any questions please contact Ms. Layne Bolen, Fishery Biologist, of the Protected Resources Division at 727-570-5312.

Sincerely,



Charles A. Oravetz
Chief, Protected Resources Division

References Cited:

Fonseca, M.S. 1998. Memorandum to M. Thompson, NMFS Habitat Conservation Division, Response to comments by C. Isiminger and attachments. 18 August.

Josselyn, M., M.S. Fonseca, T. Niesen and R. Larson. 1986. Biomass, production and decomposition of a deep-water seagrass, *Halophila decipiens* Ostenf. Aquatic Botany, Vol. 25, p. 47-61.

Kenworthy, W.J., C.A. Currin, M.S. Fonseca and G. Smith. 1989. Production, decomposition, and heterotrophic utilization of the seagrass *Halophila decipiens* in a submarine canyon. Mar. Ecol. Prog. Ser. 51:277-290.

Planning Division
Environmental Branch

DEC 08 1999

Mr. Charles A. Oravetz
Chief, Protected Resources Division
National Marine Fisheries Services
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

Dear Mr. Oravetz:

This is in reference to the Section 1135 Peanut Island Environmental Restoration Project Study in Lake Worth Lagoon, which we are currently conducting. We received your March 9, 1999 Section 7 consultation reply (enclosed) that requested additional information concerning the listed Johnson's Seagrass in the project vicinity. After further investigations and design considerations, adverse affect to the Johnson's Seagrass within the project vicinity are unlikely.

The approximate 1.0 acre area of seagrass located to the southeast of the proposed Section 1135 Peanut Island Environmental Restoration Project was inspected by a U.S. Army Corps of Engineers and local sponsor dive team September 20, 1999. No activity is planned within 25 feet of this area. The team's inspection revealed the seagrass area to be comprised primarily of Cuban Shoalweed (*Halodule wrightii*) with Johnson's Seagrass (*Halophila johnsonii*) in the deeper areas (down to 6-0' MLW) and shallow areas (up to 1-0' MLW). It was also noted the substrate changed from sand to small rock along the eastern edge of the seagrass area. Some areas of mixed seagrass (co-dominance of both species) was also noted (see enclosure 2).

The shallow water reef and lagoon component proposed on the southeast corner of Peanut Island is proposed to be excavated from the island upland area to avoid adverse affects to the existing seagrass patch in that vicinity. The "fingers" are no longer proposed in the shallow water reef and lagoon restoration component. The approximate distance between the proposed reef and the existing seagrass bed is still being finalized at this time. The proposed environmental restoration components are not anticipated to change the tidal flushing patterns to adversely affect the seagrass patch in the project vicinity. The National Marine Fisheries Service monitoring recommendations have been noted. We concur that the 'new lagoon' could provide valuable information on the recruitment of seagrasses in a manner similar to the environmental restoration completed at Munyon Island in Lake Worth Lagoon.

Based on this information, we do not believe the existing patch of seagrass in the vicinity of the proposed environmental restoration project will be adversely affected. In addition, the proposed project is an environmental restoration project that proposes to restore historical maritime hammock, mangrove and seagrass habitat. Therefore, pursuant to Section 7 of the Act, we have determined that the proposed action would not likely adversely affect Johnson's Seagrass and are asking for concurrence in this matter.

While we believe there would be no "incidental take" of Johnson's Seagrass, it appears that there is no incidental take prohibition for this threatened plant species (Final ESA Consultation Handbook, March 1998). This action would not occur in or impact any proposed critical habitat for the species (Federal Register, December 2, 1999).

If you have any questions concerning this project, please contact Mr. Paul Stevenson at 904-232-2130.

Sincerely,

James C. Duck
Chief, Planning Division

Enclosures

Copy Furnished:

Mr. Carmen Vare-Vernachio, Environmental Specialist, Palm Beach County DERM
3323 Belvedere Road, Bldg 502, West Palm Beach Florida 33406

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FLORIDA DEPARTMENT OF STATE

Katherine Harris

Secretary of State

DIVISION OF HISTORICAL RESOURCES

Mr. George M. Strain
Jacksonville District Corps of Engineers
P. O. Box 4970
Jacksonville, FL 32232-0019

December 17, 1999

RE: DHR Project File No. 997623
Cultural Resource Assessment Survey of Peanut Island, Palm Beach County, Florida. By
Environmental Services, Inc., October 1998.

Dear Mr. Strain:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), as well as those contained in Chapter 267.061, Florida Statutes, implemented through 1A-46 *Florida Administrative Code*, we have reviewed the results of the field survey of the referenced project and find them to be complete and sufficient.

We note that no historic properties were located as a result of the above referenced survey, except for the previously recorded Lake Worth Inlet USCG Station and the Kennedy Bunker. It is the opinion of this agency that because of the nature of the project, removal of vegetation will not impact any historic resources.

If you have any questions concerning our comments, please contact Ms. Robin Jackson, Historic Sites Specialist at (850) 487-2333 or 1-(800) 847-7278. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

Laura Q. Kornmeier

for

Janet Snyder Matthews, Ph.D, Director
Division of Historical Resources
State Historic Preservation Officer

JSM/Jrj

86

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<input type="checkbox"/> Director's Office (850) 488-1480 • FAX: 488-3355	<input type="checkbox"/> Archaeological Research (850) 487-2299 • FAX: 414-2207	<input checked="" type="checkbox"/> Historic Preservation (850) 487-2333 • FAX: 922-0496	<input type="checkbox"/> Historical Museums (850) 488-1484 • FAX: 921-2503
<input type="checkbox"/> Historic Pensacola Preservation Board (850) 595-5985 • FAX: 595-5989	<input type="checkbox"/> Palm Beach Regional Office (561) 279-1475 • FAX: 279-1476	<input type="checkbox"/> St. Augustine Regional Office (904) 825-5045 • FAX: 825-5044	<input type="checkbox"/> Tampa Regional Office (813) 272-3843 • FAX: 272-2340

Planning Division
Environmental Branch

FEB 14 2000

Mr. Charles A. Oravetz
Chief, Protected Resources Division
National Marine Fisheries Services
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

Dear Mr. Oravetz,

This letter initiates coordination under the Magnuson-Stevens Fishery Conservation and Management Act. It is in reference to the Section 1135 Peanut Island Environmental Restoration Project Study in Lake Worth Lagoon, which we are currently conducting. The project proposes to restore approximately 3 acres of existing mangroves habitat by creating 1.5 acres of tidal flushing channels and inlet ponding areas. The project also proposes to create 1.3 acres of shallow water reef, 3 acres of shallow water lagoon, remove exotic vegetation and plant approximately 7 acres of native maritime hammock species, 4 acres of coastal strand species, 4.6 acres of beach dune species and 16 acres of submerged wetlands (see enclosure 1).

The shallow water reef and lagoon component proposed on the southeast corner of Peanut Island is proposed to be excavated from the island upland area to avoid adverse affects to the existing seagrass patch in that vicinity. The proposed environmental restoration components are not anticipated to change the tidal flushing patterns to adversely affect the seagrass patch in the project vicinity (see enclosure 2). The project would provide additional habitat and habitat improvement for seagrass, mangroves and open water.

Therefore, pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (Section 600.920(g)), we have determined that the proposed action would not likely adversely affect any essential fish habitat within the project area and are asking for concurrence in this matter.

A copy of the revised draft Peanut Island, Environmental Assessment, January 2000, is enclosed for your information.

James C. Duck
Chief, Planning Division

Enclosure

Copies Furnished:

**Mr. Mark Thompson, National Marine Fisheries Service, Environmental Assessment
Branch, 3500 Delwood Beach Road, Panama City, Florida 32407-7499**

**Mr. Carmen Vare-Vernachio, Environmental Specialist, Palm Beach County Department
Environmental Resources Management, 3323 Belvedere Road, Building 502, West
Palm Beach, Florida 33406**

See:



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

February 29, 2000

Mr. James C. Duck, Chief Planning Division
Department of the Army, Corps of Engineers
Environmental Branch
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Duck:

The National Marine Fisheries Service (NMFS) has reviewed your staff's letter dated February 7, 2000, concerning coordination under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and the revised draft Environmental Assessment (EA) dated January 2000 for the proposed Peanut Island Environmental Restoration Project in Lake Worth, Palm Beach County, Florida.

The proposed restoration project includes constructing a 1.3 acre shallow water reef, 3.0 acres of mangrove restoration, 3.0 acres of shallow water lagoon, tidal ponds and channels, 7.1 acres of maritime hammocks restoration, 3.9 acres of coastal strand restoration, and 4.6 acres of beach dune restoration. In addition, dredged material used in the above mentioned restoration components of Peanut Island will be used for the restoration of 16.0 acres of a previously dredged site within Lake Worth (City of Lake Worth Wetland Restoration area). The latter will restore the shallow water habitat of the dredged area in order to provide suitable conditions for recolonization of seagrasses and benthic communities. The close proximity of the project to the Lake Worth Inlet should provide high water quality and recruitment of marine organisms to the restored habitat. The project design should maximize the amount of tidally influenced habitat and may increase the potential of mangrove and seagrass recruitment to Peanut Island. For this aspect of the work, we concur with your determination that the proposed action would not likely adversely affect *Essential Fish Habitat* as designated under the Magnuson-Stevens Act.

However, it is not clear in the EA how the shallow water reef habitat will be designed and constructed, other than placement of limestone boulders will occur in the vicinity of the proposed lagoon area on the southeast side of the island. Because of the apparent close proximity of the proposed shallow water reef to existing seagrasses, the seagrass area should be monitored to assess direct impact during reef construction and from any scouring that may occur from wave energy deflecting from the limestone boulders.



Also, based on a recent Corps of Engineers' (COE) Notice of Noncompliance (199603357[NC-BM]) to Palm Beach County and their contractor, Intercounty Engineering Inc., for unauthorized work in seagrasses at the Light Harbor Marina Park from barges and tug boats associated with permitted work on Peanut Island, the NMFS has concerns that barges and other equipment working within the area around Peanut Island during the COE's restoration project will also impact shallow seagrass beds in Lake Worth. The COE should prepare, and provide for our review, a construction plan that details the operating depths of the barge staging areas, routes to and from Peanut Island, locations in the area where seagrasses exist and the means to avoid impacting these areas. We recommend a pre- and post-construction seagrass monitoring schedule be implemented. This will provide current data if impacts to seagrass habitat do occur.

In consideration of the potential impacts associated with seagrass habitat and to ensure the conservation of Essential Fish Habitat and fishery resources, the NMFS recommends that the final action on the proposed action should require the following:

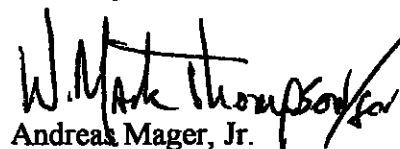
EFH Conservation Recommendation

1. That a construction plan for all aspects of the project be developed to avoid seagrass impacts.
2. A seagrass monitoring plan be developed for the area of Lake Worth that will be subjected to construction equipment and activities associated with this project.

Please be advised that the Magnuson-Stevens Act and the regulation to implement the EFH provisions (50 CFR Section 600.920) require your office to provide a written response to this letter. That response must be provided within 30 days and at least 10 days prior to final agency action. A preliminary response is acceptable if final action cannot be completed within 30 days. Your final response must include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the activity. If your response is inconsistent with our EFH Conservation Recommendation, you must provide an explanation of the reasons for not implementing those recommendations.

We appreciate the opportunity to provide these comments. If we can be of further assistance, please advise. Related comments, questions or correspondence should be directed to Mr. Michael R. Johnson in Miami, Florida, at 305-595-8352.

Sincerely,



Andreas Mager, Jr.
Assistant Regional Administrator
Habitat Conservation Division

DIVISIONS OF FLORIDA DEPARTMENT OF STATE
 Office of the Secretary
 Office of International Relations
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LAKE WORTH LAKE

Mr. John R. Hall
 Regulatory Division, Permits Branch
 Jacksonville District, Corps of Engineers
 P.O. Box 4970
 Jacksonville, Florida 32232-0019

September 27, 2000

RE: Corps of Engineers - Individual Permits
 Public Notice Applications Reviewed by the Florida State Historic Preservation Office
 No Historic Properties Affected - See Attached List

Dear Mr. Hall:

Our office has received and reviewed the above referenced project in accordance with Section 106 of the National Historic Preservation Act of 1966 (Public Law 89-665), as amended in 1992, and 36 C.F.R., Part 800: Protection of Historic Properties. The State Historic Preservation Officer (SHPO) is to advise and assist federal agencies when identifying historic properties (listed or eligible for listing, in the National Register of Historic Places), assessing effects upon them, and considering alternatives to avoid or reduce the project's effect on them.

We have reviewed the Florida Master Site File and our records and no historic properties are known to exist in the area of potential effect. Therefore, based on the information provided, it is the opinion of this office that no historic properties will be affected by this undertaking.

If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservation Planner, at 850-487-2333 or 800-847-7278. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

Janet Snyder Matthews, Ph.D., Director
 Division of Historical Resources
 State Historic Preservation Officer

JSM/Ese

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☐ Tampa Regional Office
 (813) 272-3843 • FAX: 272-2340

Mr. Hall
September 27, 2000
Page 2

DHR's NO.	PERMIT NO	COUNTY	APPLICANT
2000-06505	199905053 (IP-DH)	Okaloosa	Benedict Engineering Co.
2000-06193	200002515 (IP-RM)	Palm Beach	City of Lake Worth Wetland Restoration ✓
2000-06407	199901558 (IP-ES)	Pasco	Devco III, LLC
2000-06408	200002380 (IP-RLW)	St. Johns	Robert Davis
2000-06443	199904367 (IP-ME)	St. Johns	Richard Smith
2000-06195	199100082 (IP-TA)	St. Lucie	Ballantrae Homeowners Association
2000-06232	200002421 (IP-JC)	St. Lucie	Tropicana Products, Inc
2000-06235	199803448 (IP-DH)	Walton	The St. Joe Company



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

December 20, 2000

Colonel James G. May
District Engineer, Jacksonville District
Construction-Operations Division
Department of the Army, Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel May:

The National Marine Fisheries Service (NMFS) has reviewed Public Notice PN-PBH-246, dated November 21, 2000, regarding the removal and disposal of 600,000 cubic yards of spoil material from Peanut Island at Lake Worth, Palm Beach County, Florida. The Army Corps of Engineers (COE) proposes to place the spoil material over approximately 584 acres of estuarine and marine tidal and subtidal waters in at least one of three alternative disposal sites. The three proposed disposal sites include the nearshore waters south of Lake Worth Inlet, beach renourishment at Palm Beach Midtown Beach, and an open water area adjacent to the Lake Worth Municipal Golf Course.

The proposed project is located in an area identified as Essential Fish Habitat (EFH) by the South Atlantic Fishery Management Council (SAFMC). Categories of EFH that may occur within the project vicinity include estuarine and marine water column, seagrass, live/hard bottoms, and coral and coral reefs. Some of the managed species associated with estuarine and marine water column, seagrass, live/hard bottoms, and coral and coral reefs at the project site include postlarval, juvenile, and adult gray snapper, white grunt, and red and gag groupers. Seagrass habitat, estuarine mud bottoms, and areas adjacent to South Atlantic inlets have been identified as EFH for the eggs, larvae, postlarvae/juvenile, subadults, and adult red drum. In addition, postlarval/juvenile and adult brown and pink shrimp are known to inhabit seagrass habitat, areas adjacent to inlets, and estuarine mud bottoms found within the area. Detailed information on shrimp, red drum, snapper/grouper complex (containing ten families and 73 species), coral and coral reefs and other Federally managed fisheries and their EFH is provided in the 1998 amendment of the Fishery Management Plans (FMP) for the South Atlantic region prepared by the SAFMC. The 1998 generic amendment was prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 94-265). The NMFS has developed an applicable FMP for highly migratory species that utilize the estuarine and marine water column, seagrass beds, live/hard bottoms, and coral and coral reefs in this area, including nurse, bonnethead, lemon, black tip, Caribbean reef, and bull sharks. In addition, submerged aquatic vegetation, inlets, hard bottom, and coral reefs have been defined as Habitat Area of Particular Concern (HAPC) by the SAFMC for shrimp, snapper/grouper complex, red drum, and



coral and coral reefs. HAPCs are subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area.

In addition to EFH for federally managed species, seagrasses provide nursery, foraging, and refuge habitat for other commercially and recreationally important fish and shellfish. Species such as blue crab, snook, striped mullet, spotted seatrout, sheepshead, black drum, and various tropical reef fishes are among the many species that utilize this habitat. Seagrass habitat also produces and exports detritus (decaying organic material) which is an essential element of the marine and estuarine food webs. Cumulatively, adverse impacts to seagrass, live/hard bottom, coral and coral reef habitats result in a reduction of overall fisheries productivity within the south Florida ecosystem.

Information provided in the public notice indicates that beach-grade spoil material will first be placed in the nearshore area south of Lake Worth Inlet and the remainder at the Palm Beach Midtown beach. Although details regarding the location and methods for placement of this material were lacking in the public notice, we presume that it is intended to supplement the fill material for the renourishment of these beaches. The NMFS has reviewed the Midtown Beach renourishment project for the Town of Palm Beach (COE permit application 199503779) and provided EFH Conservation Recommendations. Due to the adverse impacts related to burial and sedimentation of live/hard bottoms, coral and coral reefs, and artificial/manmade reefs, we recommended denial of the project as proposed. Regarding the spoil disposal in the nearshore area south of Lake Worth Inlet, information about the presence of hard bottom/coral reef habitats was not mentioned in the public notice. However, these habitats are known to exist in this area and a benthic survey to include the equilibrium toe of fill should be completed if this area is selected as one of the disposal sites.

A third alternative disposal site is an open water area, characterized as containing anoxic holes, adjacent to the Lake Worth Municipal Golf Course. The NMFS has previously reviewed this proposed project through permit application 200002515 (IP-RM) for the Palm Beach County Board of Commissioners. The NMFS has objected to this proposed project for several reasons, but primarily due to the elimination of 0.67 acre of seagrass habitat and the great uncertainty that seagrasses will reestablish in the area after fill has been placed. Furthermore, the enlargement of two golf tees over 0.4 acre of tidal and subtidal waters, resulting in adverse impacts to submerged aquatic vegetation, did not appear to have any beneficial wetland restoration function.

Several species of seagrasses are found in the area of Lake Worth near Peanut Island, including shoalgrass, manatee grass, turtlegrass, paddle grass and Johnson's seagrass. Johnson's seagrass is listed as threatened under the Endangered Species Act. To adequately evaluate impacts to Johnson's seagrass, consultation under Section 7 of the Endangered Species Act may be required. Layne Bolen of our Protected Resources Division should be contacted at (850) 234-6541, ext. 237.

Seagrass density is relatively low in the areas associated with previously dredged portions of Palm Beach Harbor. However, seagrass density and abundance is high surrounding Peanut Island. Figure 6 of the Environmental Restoration Report and Environmental Assessment for Peanut Island, dated January 2000, indicates that seagrass beds were found along Peanut Island's north, east and south shorelines. Although limited to areas within and bordering the Atlantic Intracoastal Waterway, the

COE 1999 seagrass survey (Marine Seagrass Survey of the Atlantic Intracoastal Waterway, Palm Beach County, December 1999), indicated that due to the close proximity to Lake Worth Inlet and the extensive shallow flats north of Peanut Island, seagrass cover and diversity were higher here than at any location in the study area. In view of the extensive, shallow seagrass beds in the area, a construction operations plan should include measures to avoid impacts from barges and/or pipelines used to remove spoil material from Peanut Island.

Page 5 of the public notice contains information regarding Magnuson-Stevens Fishery Conservation and Management Act and EFH. A determination was made that the proposed project would impact approximately 584 acres of estuarine substrata, but that it would not have a substantial adverse impact on EFH on Federally managed fisheries in the Gulf of Mexico. Please note that the subject project is located within an area under the jurisdiction of the South Atlantic Fishery Management Council, which does not include waters of the Gulf of Mexico. Regardless, considering the 0.67 acre of seagrass impacts associated with the Lake Worth Municipal Golf Course project, at least 0.3 acre of hard bottom habitat associated with the Midtown Beach project, and an undetermined amount of hard bottom habitat that could be impacted at the nearshore area south of Lake Worth Inlet, the NMFS does not agree with the COE determination of no adverse impact to EFH.

According to the public notice, an environmental assessment (EA) for the project was completed in October 2000, and used as the basis for the environmental review for this public notice. Based upon the EA, a Finding of No Significant Impact was made for the proposed project. The NMFS' Habitat Conservation Division was not provided an opportunity to review and comment on the EA, although a copy recently was forwarded to us at our request. Based upon our review of the EA, the following comments are provided.

Determinations were made by the COE that no adverse effects to seagrasses or any threatened and endangered species are anticipated with the disposal of spoil material at the Lake Worth Municipal Golf Course site. However, based upon surveys by the Palm Beach County, there would be 0.67 acre of seagrass impacts, including 0.25 acre of impacts to Johnson's seagrass, from the proposed project.

A COE determination was also made that no impacts or adverse effects to threatened or endangered species are anticipated from the disposal of spoil at the Midtown Beach location. However, recent aerial surveys revealed that nearly 60 percent of all turtles sighted along the Atlantic coastline in Palm Beach County were along a 2.5-mile stretch of nearshore reef in front of the Breaker's Hotel (Midtown Beach)¹. The study suggests that sea turtles may be attracted to these reefs due to the high vertical relief and complexity and the relatively shallow water depths they provide. The proposed disposal at this site would bury nearshore hard bottom habitats that juvenile and adult sea turtles use for feeding and foraging.

¹Carson, D.C. (in press). Relative abundance and distribution of sea turtles in the marine and estuarine waters of Palm Beach County, Florida, USA based on aerial surveys, 1990-1993. In 19th Annual Symposium on Sea Turtle Biology and Conservation, March 1999, South Padre Island, Texas.

The discussion of the MSFCMA contains a statement that EFH coordination with NMFS has been completed with this EA coordination. Because NMFS's Habitat Conservation Division was not provided an opportunity to comment on the October EA, EFH coordination has not been completed.

A determination was made that spoil disposal in the open waters adjacent to Lake Worth Municipal Golf Course should not pose a turbidity problem. The NMFS has concerns regarding the resuspension of fine sediments that exist on the bottom after the placement of 600,000 cubic yards of fill over 99 acres of open water habitat. Resuspension of this sediment is likely given the Palm Beach County's report indicating that the existing sediments are composed of 83 percent silt/clay. Information on how turbidity will be controlled during the disposal operations has not been provided by either Palm Beach County or the COE.

Inconsistencies were noted in Table 1. A "No Adverse Effects Anticipated" assessment was made for the disposal at all three proposed sites. In view of the anticipated impacts to seagrass and hard bottom habitats, this determination does not appear to accurately reflect impacts to fish and wildlife resources. Under the Water Quality category, a "No Discharge into Wetlands or Florida Waters" assessment was made for all three proposed disposal sites, which seems contrary to the purpose of the proposed project. Finally, for the Lake Worth Municipal Golf Course, a "No Impacts" determination was made for the Vegetation category. Considering the impacts to seagrass habitat from this project, this assessment seems inappropriate.

In view of the potential adverse effects of this project to EFH, HAPC and NOAA trust resources, the NMFS recommends that additional information be provided for our review. At a minimum, recent surveys and assessments should encompass the following:

1. A complete description of the anticipated direct and indirect impacts to aquatic resources, including seagrasses and hard bottom/coral reef communities, should be assessed. This should include areas within the proposed spoil disposal sites and any pipeline corridors, as well as adjacent areas that may be impacted by turbidity plumes or by construction barges and tug boats. Because Johnson's seagrass may exist within the vicinity, seagrass surveys should be conducted between May and August.
2. The COE should prepare and provide for our review a construction plan that details the operating depths of the barge staging areas, routes to and from the project dredge sites, locations in the area where seagrasses exist and the means to avoid impacting these areas.

After our review of the requested information, NMFS will be able to more thoroughly assess the potential adverse impacts to EFH and associated marine resources. When the information needs that we have identified are met, we will reevaluate these recommendations and provide supplemental recommendations, as appropriate.

EFH Conservation Recommendations


1. A plan should be developed and implemented to avoid and/or minimize damage by mechanical operations, siltation, turbidity and burial of any seagrass, hard bottom and live coral habitats. This plan should be made available to NMFS for review prior to final approval.

2. A plan to fully compensate for unavoidable adverse impacts to seagrass, hard bottom, coral and other sensitive habitats should be designed and should be made available to NMFS for review prior to final approval.

Please be advised that the Magnuson-Stevens Act and the regulation to implement the EFH provisions (50 CFR Section 600.920) require your office to provide a written response to this letter. That response must be provided within 30 days and at least 10 days prior to final agency action. A preliminary response is acceptable if final action cannot be completed within 30 days. Your final response must include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the activity. If your response is inconsistent with our EFH Conservation Recommendation, you must provide an explanation of the reasons for not implementing those recommendations.

If we can be of further assistance, please advise. Related comments, questions or correspondence should be directed to Michael R. Johnson in Miami. He may be contacted at 305-595-8352 or at the letterhead address above.

Sincerely,


for Andreas Mager, Jr.
Assistant Regional Administrator
Habitat Conservation Division

cc:

EPA, WPB
DEP, WPB
FFWCC, Tallahassee
FWS, Vero Beach
F/SER3
F/SER4
F/SER43-Johnson

11-9-01

Planning Division
Environmental Branch

11-9-01

Mr. Andreas Mager, Jr.
Assistant Regional Administrator
Habitat Conservation
National Marine Fisheries Service
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

Dear Mr. Mager:

The U.S. Army Corps of Engineers (Corps), Jacksonville District, proposes to offload 600,000 cubic yards of dredged material stored on Peanut Island, and change maintenance operations from winter hopper dredging to summer pipeline dredging. The project would also involve the removal of an existing berm and constructing a new berm, in addition to, removing material to facilitate the new environmental restoration of Peanut Island under Section 1135 of the Water Resources Act, as amended. The project site is located on Peanut Island, Palm Beach County, Florida.

One of three disposal options is proposed for the offloaded material. The Corps' recommended disposal option is located adjacent to the City of Lake Worth Municipal Golf Course. This area has been subjected to seagrass surveys conducted by the Palm Beach County, Department of Environmental Resources Management (1998 and 2000) and the Corps' contractor, Dial Cordy and Associates (1999). Each survey documents the presence of seagrass, including the threatened species Johnson's seagrass (*Halophila johnsonii*). Johnson's seagrass occur in sparse quantity (about 0.25 acre) along the shoreline. The project would not directly impact the species or involve the creation of fastland for the existing golf course. We believe the project would not jeopardize the continued existence of any threatened or endangered species or have adverse impacts to critical habitat. Also, the proposed action would not adversely impact marine/estuarine resources or essential fish habitat. The project would provide habitat for seagrass. This would be achieved by filling existing deep holes and raising the elevation to support the colonization and attachment of seagrass species, including Johnson's seagrass.

In accordance with your letter commenting on this proposed activity and the presence of Johnson's seagrass in the project area, the Corps requests formal consultation for the species under Section 7 of the Endangered Species Act.

In addition, we propose to monitor the success of seagrass in this area and claim mitigation credit for future dredging in Lake Worth and Palm Beach Harbor. We request your concurrence that successful colonization of seagrass in this mitigation area would compensate for equivalent loss of seagrass from dredging.

Sincerely,

James C. Duck
Chief, Planning Division

Copies Furnished:

Mr. George Getsinger, National Marine Fisheries Service, 6620
Southpoint Drive South, Suite 310, Jacksonville, Florida
32216-0958

U.S. Environmental Protection Agency, Office of Environmental
Assessment, Region Four, Atlanta Federal Center, 61 Forsyth
Street Southwest, Atlanta, Georgia 30303-8960

U.S. Fish and Wildlife Service, South Florida Ecosystem Office,
1339 20th Street, Vero Beach, Florida 32960-3559

Florida State Clearinghouse, Department of Community Affairs,
2555 Shumard Oak Boulevard, Tallahassee, Florida 32399-2100

Planning Division
Environmental Branch

APR 15 2002

Mr. Andreas Mager, Jr.
Assistant Regional Administrator
Habitat Conservation Division
National Marine Fisheries Service
9721 Executive Center Drive North
St. Petersburg, Florida 33702

Dear Mr. Mager:

Reference is made to your letter of December 7, 2001, wherein a response was provided to the U.S. Army Corps of Engineers' (Corps) letter of November 9, 2001 (enclosure 1). The Corps and the Florida Inland Navigation District (FIND) propose to offload dredged material stored on Peanut Island and change the harbor dredging method from hopper to pipeline dredge. The preferred material disposal site is a deep dredged hole located adjacent to the City of Lake Worth Municipal Golf Course, in Palm Beach County, Florida.

The Corps shares your agency's concerns for adverse impacts and losses that may result to essential fishery habitat (EFH) of managed species, including submerged aquatic vegetation (SAV) in the vicinity of Palm Beach Harbor and Lake Worth Inlet. As you are aware, the Corps and Palm Beach County propose restoration activities on behalf of the Florida Inland Navigation District. The proposed restoration efforts would create 11.1 acres of mangrove habitat, 2.3 acres of oyster reef area, 2.8 acres of salt marsh, and potentially 73.8 acres of seagrass habitat (see enclosure 2).

We believe as stated in the environmental narrative submitted to the South Florida Water Management District by Palm Beach County (enclosure 3), that once the deep hole has been filled to the proper elevations with suitable substrate, Seagrass recruitment will likely occur. This process should be greatly enhanced by sea grasses which currently exist within the project's vicinity. A similar project proposed at Munyon Island located 2 miles north of the Lake Worth Inlet was also successful within three years of the final restoration phase sea grasses had recruited in tidal channels constructed during

Phases I and II of Munyon Island restoration efforts (enclosure 3).

Below you will see a summary of your concerns and the Corps' response in the order presented:

1. The NMFS recommended the Corps (a) estimate seagrass coverage and density that may be achieved in the mitigation area; (b) compare the average coverage and density of seagrass beds anticipated in the mitigation area to existing seagrass beds that would be impacted by the project; and (c) analyze and compare ecological functions of the proposed mitigation area and impact area from future dredging in the area, including impacts to fish and invertebrates occurring in each area.

Response:

(a) Estimate of Seagrass Coverage in Mitigation Area:
Our contractor Dial Cordy and Associates Inc. conducted a seagrass survey of the subject advanced seagrass mitigation site in August 2000. They used the Braun Blanquet method for assessing cover, abundance and density. A copy of this report is enclosed for your use. While this report gives you a good idea of what was present at that time, it does not really reflect what can be restored. We are considering additional baseline survey work as warranted, especially as it relates to determining the compensation depth for seagrass and defining desired depths.

(b) Cover and Density of Seagrass in Mitigation vs. Seagrass Impacted: At present, we can't provide you with exact details pertaining to seagrass data as the proposed dredging projects for the Atlantic Intracoastal Waterway (AIWW) and Palm Beach Harbor are not far enough along. As you are aware, we expect to prepare an Environmental Impact Statement (starting this fiscal year) that will address impacts associated with the AIWW dredging. While our preliminary analysis prior to plan formulation did indicate as much as 25 acres of seagrass could be impacted. We expect considerable revisions to occur over the next year. Once we have determined what the plan will entail, we will provide this information to you. We expect that similar methods, as defined above, would be used to quantify and compare seagrass conditions at potential impacted sites and the proposed

seagrass mitigation site. At this time, we expect to fill the site with material from Peanut Island and based on success, as measured by monitoring, gain advanced credit for future work.

(c) Analysis of Ecological Function (i.e., fish abundance:
At present, we are not planning to conduct fish and benthic surveys in all the areas. Our assumptions are that if we restore seagrass habitat we will attract the typical benthic and fish species common to seagrass communities in Lake Worth. Due to the physio-chemical gradient differences between potential impact areas and the fill area, located further south in the lagoon. It is entirely possible that the restored seagrass habitat would support a faunal community somewhat different from the impacted areas. In terms of fish migration, there would remain a more or less continuous access corridor between shallow water habitats and the deeper channels between the inlets and advanced mitigation site. We believe by conducting baseline surveys and designing the site in accordance with guidelines by Fonseca et al 1998 that we will create conditions suitable for the recruitment and maturation of seagrass habitat and its associated biological communities. We expect the measure of success to be based on the cover abundance and density of seagrass at the restored site.

2. Provide information on how turbidity is to be controlled during the disposal operations. This information should also include existing fine sediments that might be displaced during and after construction.

Response:

Control Turbidity and Fine Sediments. Material placement could contribute to turbidity and fine sediments suspension. However, assurances are proposed that would confine turbidity and prevent suspension beyond the footprint of the work area. Turbidity controls would encompass the entire project area and preserved seagrass area. Pilings would secure the controls in place and would open only to allow work vessels entrance and exits. We further propose to place the material in the dredged hole mechanically. This method would greatly reduce sediment suspension. Enclosed is a copy of our turbidity specifications (enclosure 4). These specifications will be modified if appropriate. Also enclosed is the geotechnical report on

material to be offloaded from Peanut Island, in addition to, a sediment analysis on material representative of the dredged hole (enclosure 5).

3. Provide information regarding the allocation of mitigation for the County's Lake Worth Wetland Restoration Project and the Corps' mitigation project. This information should include aerial boundaries of the two projects to effectively determine seagrass recruitment criteria and success.

Response:

Mitigation Benefits Allocation. The current plan for the site includes restoration of mangrove, oyster and seagrass habitat, with the former two being designed and monitored by Palm Beach County as part of the Section 1135 project. The portion of the environmental restoration attributable to the Section 1135 Environmental Restoration Project cannot and will not be used for mitigation credits. Approximately 3 acres of the seagrass restoration would be the County's and the balance (71 acres) would be the Corps' responsibility. It is expected that success will be detectable within the first two growing seasons.

We are working with Palm Beach County to prepare a plan depicting aerial limits of both projects as well as defining success criteria and monitoring obligations.

4. Develop a mitigation plan with success criteria, monitoring schedules, and contingencies measures.

Response:

Mitigation Monitoring Plan. We agree with this comment and will prepare a definitive plan, including schedules, success criteria, monitoring methodology and contingencies. Please realize we will only be asking for credit for those areas where success criteria is evident on a yearly basis. The success criteria we will use will be based on parameters such as areal cover, density and abundance values as compared to reference station values. These standards are commonly used to determine the health of existing seagrass beds. Reference stations will be established in the same reach of Lake Worth and monitored

prior to and concurrently with the annual restoration site monitoring. Due to differences in the site conditions and seagrass communities closer to the inlet, a comparison to seagrass bed data there with conditions further south at the restoration site would not be practicable. We have considerable data throughout the lagoon and believe excellent reference sites can be selected based on concurrence with your office.

5. Provide an evaluation of alternative seagrass mitigation sites which include identified borrow or dredged holes in the vicinity of Palm Beach Intracoastal Waterway and Palm Beach Harbor dredging projects.

Response:

Alternative Mitigation Sites. The Lake Worth Municipal Golf Course site is the largest dredged hole in Lake Worth. There are possibly other dredged holes or abandoned slips or prop scars sites which may present a mitigation opportunity. We are discussing alternative site locations with Palm Beach County staff and will provide a list for your agency's review upon receipt. These sites, however, may be small, scattered, and cost prohibitive. Cumulatively we don't believe they would approach the proposed mitigation site in size and are probably less cost effective than restoring a single large site. The larger site also provides an environmentally beneficial means of disposing of dredged material. Future dredging needs may approach 1 million cubic yards of material and require the proposed increased capacity from off-loading the Peanut Island disposal site.

Comparative restorative mitigation has been accomplished on Munyon Island with great success. The Corps always welcomes an opportunity to enhance or restore degraded aquatic ecosystems. However, the extent of Corps participation is usually dictated by project size. Material quantity and transport cost usually prohibit transport to scattered and smaller sites. The cost of using some of the smaller sites may be somewhat offset by the possibility of requiring less material and creating denser seagrass. However, for the simplicity of construction and monitoring, we support the use of the proposed mitigation site. Additionally, the restoration of 90 acres of shallow water habitat and seagrass beds within a deep non-productive

dredged hole will greatly enhance secondary production in this area of Lake Worth. Following modifications to the C-51 Canal discharges within the next 5 years, we expect the ecological benefits of the restored habitat to be even more elevated due to improved water quality and water clarity.

We believe the project proposes positive environmental benefits and provides an opportunity to increase EFH and SAV habitats in this area and vicinity. Should you require any additional information, please contact Ms. Catherine L. Brooks, of my staff at either the letterhead address, e-mail address Catherine.l.brooks@usace.army.mil, or telephone number 904-232-2130.

Sincerely

James C. Duck
Chief, Planning Division

Enclosures



May 15, 2001

County Administration

P.O. Box 1989

West Palm Beach, FL 33402-1989

(561) 355-2030

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Addie L. Greene

County Administrator

Robert Weisman

*"An Equal Opportunity
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James C. Duck, Chief
Planning Division
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Dear Mr. Duck:

**SUBJECT: DETAILED PROJECT REPORT PALM BEACH HARBOR LAKE
WORTH ACCESS CHANNEL EXPANSION, SECTION 107
SMALL NAVIGATION PROJECT**

We appreciate the opportunity to comment on the subject report and support the concept of the Lake Worth Access Channel Expansion or "Megayachts". Deep water access to local marinas and boatyards will provide economic incentives, employment opportunities and marine industry improvements for Palm Beach County.

Although the report provides a methodical breakdown of the cost benefits associated with various channel depths and project scopes, the principle weakness of the plan lies in the lack of a regional management analysis to include other planned and existing dredging projects in the same area. The analysis should consider construction schedules, the relative quality of the available material, permitting criteria, funding alternatives and construction methodologies in terms of both cost and environmental impacts.

Palm Beach County proposes an alternative plan to deal with these concerns (see enclosed comments and sand management plan). As a first step, we advocate downloading Peanut Island and utilizing the material to fill the Lake Worth Wetland Restoration (LWWR) project (referred to as the anoxic depression area in the Section 107 Report), which will provide advanced mitigation for the subject project. This will allow for the beneficial use of suitable material from the Megayachts project to be placed on the beach and nearshore. The entire Megayachts project could be accomplished in a cost-effective manner using hydraulic equipment (rather than employing two different methodologies) to facilitate the placement of material in appropriate locations on the beach, nearshore and Peanut Island.

The County has received the state environmental permit and partial funding for the LWWR project and we are in the process of establishing an agreement with the City of Lake Worth. With City approval, we will continue on our present course to download Peanut Island and would recommend that a majority of the LWWR project be used as advanced mitigation for the construction of the Megayachts project. This concept has the support of the Florida Inland Navigation District and the Marine Industries Association, our two greatest allies in seeing the project go forward.



J.C. Duck
May 15, 2001
Page 2

Completing the LWWR project with Peanut Island spoil and naming the Megayachts project as the recipient for the mitigation credit will likely minimize the future mitigation requirements by providing an established seagrass-mangrove system. This is an economically and environmentally feasible alternative that provides higher mitigation certainty than post-construction mitigation which typically requires a higher ratio compensation to account for possible failure. The National Marine Fisheries Service and other resource agencies are likely to embrace this concept versus post-construction mitigation, with no guarantees for success.

The Megayachts project is at the beginning of what may be a lengthy process of receiving the necessary permits and approvals. Currently, we are continuing with the construction plans for the Peanut Island, John's Island and LWWR projects. If work is not undertaken as scheduled, the County could lose up to \$1.8 million dollars from the Lake Worth Lagoon Partnership Program. Timing is one of our main concerns. Downloading and restoring Peanut Island at the same time would appear to be the most efficient use of barges, tugs, and heavy equipment. Coordinated project efforts will represent cost savings for mobilization and will also create an area on Peanut Island capable of holding non-suitable material generated from dredging the Megayachts project and provide advance mitigation for expected seagrass losses.

We look forward to cooperative agency efforts and are eager to begin these projects that will improve the Lake Worth Lagoon both environmentally and economically. We are willing to work with the Jacksonville District to balance the mixed objectives of this project and to provide the most productive and feasible result for all parties concerned. Please call me at (561) 355-2712 or Richard Walesky at (561) 233-2400, if you have any questions or need additional information.

Sincerely,

Robert Weisman
County Administrator

REW:JOB
Enclosures

c: Palm Beach County Board of County Commissioners
Richard E. Walesky, Director, Department of Environmental
Resources Management
Dennis Eshleman, Director, Parks and Recreation Department
David K. Roach, Executive Director, Florida Inland Navigation District
Tony Taramino, Executive Director, Port of Palm Beach
John Sprague, President, Marine Industries Association
Peter Elwell, Manager, Town of Palm Beach
James Bronstien, President, Rybovich Spencer
Bill Hayes, Executive Director, Perry Technologies
John Smundin, Marina Manager, Palm Harbor Marina
Michael Carey, Vice-President, Florida Marine
John Grant, President, Palm Beach Maritime Museum and Charter School

**DETAILED PROJECT REPORT PALM BEACH HARBOR
LAKE WORTH ACCESS CHANNEL EXPANSION
SECTION 107 SMALL NAVIGATION PROJECT**

PALM BEACH COUNTY COMMENTS - May, 2001

GENERAL

- The economic analysis (para. #141) and Recommended Plan (para. #145) state that "this project is disposal site capacity limited". The County's proposed plan for sand management eliminates the disposal site capacity limitations and accommodates sand management alternatives dictated by environmental benefits.
- The report indicates the need to complete the entire Federal (1.9 mile) and non-Federal (3.3 mile) project in order to have enough dredged material to complete the Lake Worth Wetland Restoration (LWWR) project to fulfill anticipated mitigation requirements. If the non-Federal portion is not built, there may not be sufficient fill to create enough seagrass habitat to meet the mitigation requirements for the Federal portion. The County's proposed plan for sand management eliminates the disposal site capacity limitations with or without the non-Federal project segment. However, the non-Federal project will generate the majority of non-beach compatible material (over 400,000 cy³ based on >5% silt-clay and/or >3% organics).
- #47. Lake Worth Inlet is not a natural inlet.
- #154/#161 "...Any unsuitable material could be disposed on Peanut Island." The report's recommended plan will require the construction of another dike on top of Peanut Island (which is already at +40' NGVD elevation) in preparation for the disposal of unsuitable material associated with Megayachts. This may compromise the beach quality material currently available on the island. Downloading Peanut Island, as proposed by the County and the Florida Inland Navigation District (FIND) will provide an opportunity to utilize the suitable material for the nearshore ocean environment and provide a greater capacity (on Peanut Island) for any unsuitable material associated with the Megayachts project or future projects.
- The timing of the Megayachts project versus the County's three major environmental projects (Peanut Island, John's Island and LWWR) that are permitted, funded and ready for construction, is of major concern to Palm Beach County. The delay of these projects due to the Megayachts project (as currently proposed) will effectively sacrifice these projects in terms of funding, if they are postponed due to revisions to incorporate the Megayachts project (as proposed which recommends filling the LWWR).

ENVIRONMENTAL CONCERNS/CONSTRAINTS

- **EA 3.1 and 3.2.** The extent of estimated seagrasses impacted is substantially higher than expected based on earlier correspondence (from 2 acres to 21 acres). The report does not include the extent of proposed island freighter marshalling basin (Para. #91), south of the port at the old Coast Guard property, which would increase the seagrass impact total. While it is understood that the impacts of the marshalling area will be developed in greater detail in another report, the potential impacts to seagrasses from the marshalling project should also be discussed in the Section 107 report.
- **#100 and EA 1.7.** The report suggests dredging the waterway for expansion by clamshell or cutter-suction dredge and utilizing a clamshell/barge operation for filling in the Lake Worth Lagoon. This method for inshore filling will generate high levels of turbidity which is environmentally unacceptable for a lagoon that we are trying to restore and preserve. Barging the dry/decanted material from Peanut to fill the LWWR area will be a much cleaner and efficient process and quite frankly, more acceptable to the permitting agencies.
- **Appendix A, Section 404(b)(1) Evaluation, Paragraph 11c(1), Turbidity-** It is expected that turbidity generated by clamshelling and placement of wet fill will be extensive and will be difficult to prevent water quality violations. Alternative methods proposed above will reduce these impacts.
- **Seagrass impacts** are greater than originally anticipated, though the majority appear to be related to LWW maintenance. Applicable mitigation should be addressed for relevant impacts resulting from the project.
- **Appendix A, Section 404(b)(1) Evaluation, Paragraph 11c(2)(c), Toxic Metals-** Copper has been found in sediments in the lagoon. Testing of sediments should be performed to determine extent of contamination and whether other constituents are present, particularly in the vicinity of existing marine terminals. Sampling from other portions of the lagoon indicate that metals (especially copper) will be found in the sediments. Sampling and testing for toxic metals should be performed on the sediments proposed for dredging to answer anticipated permitting issues.
- **#137 and EA 3.13, 4.2.** This project will be carefully reviewed for impacts to manatees because the waters of Palm Beach County have been determined by the United States Fish and Wildlife Service to be "manatee areas of heightened scrutiny". Contract alternatives and the dry load hauling should be used to minimize the number of barge trips along a heavily used manatee travel corridor.
- **# 128.** The report indicates that hydrodynamic effects are not expected from the dredging of the channels and the filling of the anoxic depression. This assumption should be tested in terms of water quality, tidal flushing and shoaling effects by using the Lake Worth Lagoon flow model currently being developed by the South Florida Water Management District.

USE OF "ANOXIC DEPRESSION AREA" FOR MATERIAL DISPOSAL

- #116. As property owner of the submerged lands associated with the LWWR project, the City of Lake Worth requires a shoreline erosion protection project to be associated with the LWWR project. To our knowledge, the Corps has made no effort to contact the City for their approval and does not include an erosion control feature with their proposal.
- #116 / #158 The Section 107 Report states that the LWWR area has a capacity to hold 1,050,000 cy³ to "create 90 acres of seagrasses", which is incorrect by our calculations. While the footprint of the project area approaches 100 acres, the above capacity may be achieved only with the creation of a seagrass/mangrove system, which will have the potential to provide approximately 45 acres of seagrass and 11 acres of mangroves. The remaining area will likely be too deep to support seagrasses.
- Supplemental bathymetry should be completed within the Lake Worth Lagoon to detail known anoxic dredged areas that may be utilized for mitigation or inshore disposal associated with the Megayachts project.

DREDGED MATERIAL MANAGEMENT

- #151. As the Section 107 Report states, there is substantial material from the Megayachts project that is suitable for beach and nearshore placement. However, the recommended plan puts the majority of the material in the anoxic dredged hole, with only 210,000cy³ going to nearshore. In our preliminary Sand Management Plan (see Attachment), Palm Beach County recommends that all material from the northern segment (except around core #8), inlet channel and settling basin be transported to the beach or nearshore.
- # 127. For additional mitigation credit, serious consideration should be given to the acquisition of submerged lands which currently support seagrasses. There are a number of privately held submerged parcels in the north end of the lagoon that could be purchased for this purpose.
- #152. Emphasis should be placed on obtaining the remaining easements from upland property owners to increase the potential volume of the existing permitted disposal site south of the inlet jetty. Funding from the Town of Palm Beach and FIND could be sought for deposition in established project areas when necessary.
- #156 Indicates beach disposal of 210,000cy³ associated with Megayachts, with the remaining material to be placed in the anoxic depression. The County's preliminary assessment for beach disposal indicates that over 545,000 cy³ (megayachts + Peanut Island material) is suitable for beach or nearshore placement.

- The Port of Palm Beach's dredged material maintenance area on Peanut Island should be included in this plan to download Peanut, with their approval. The dredged material on Peanut Island will be further evaluated and all compatible material will be placed on the beach or nearshore environs.
- Due to the fines and high silt/clays, material from the southern portion of the megayacht project, turning basin, and possibly the access channels, should be transported to Peanut Island or other suitable inland sites. The plan needs to address the quality of the material proposed to be dredged from the marina access channels.
- The material presently stored on Peanut Island should be used to restore all compatible sand to the beach, fill any other potential inland sites and to fill the LWWR project as advanced mitigation for the Megayachts project. The high percentage of gravel and silt throughout the site limits the viability of much of the material as beach fill. The preliminary assessment has identified approximately 100,000cy³ of material which could be deposited in the nearshore area south of the inlet or screened and placed on the beach.
- #113. The capacity of the disposal area south of the Lake Worth Inlet (LWI) is vastly underestimated. Dredging of the Megayachts project will take a full dredging season (November through March) and the downloading of Peanut Island will take at least a year. The cross shore and long shore transport of such fine grained sediments in an ocean environment is very high which will result in rapid fill dispersal. The capacity of the disposal area is being assumed from dimensions contained in the permit for the Palm Beach Harbor federal navigation project. Those dimensions are not the result of an environmental constraint and do not apply to this project. The actual dimensions for these projects are presently unknown since a permit has not been issued. Even if the disposal area dimensions remain the same, these projects are not likely to exceed the dimensions with 600,000 cubic yards being placed over a two year period.

Preliminary Assessment

- The attached table provides a preliminary assessment of a sand management plan based on the information available to date. Though driven by sand characteristics, emphasis has been placed on maximizing beach deposition while providing sufficient material to fill the LWWR site.
- The volume of sand removed from Peanut Island could be adjusted to meet the requirements of the various projects.
- The beach quality sand removed from Peanut Island could be placed in the permitted nearshore area to eliminate the need for screening the gravel sized fraction.
- The characteristics of the material from the proposed Megayacht access channels is presently unknown, so for the purposes of the plan is not assumed to be beach compatible.
- The plan would entail the use barges to offload Peanut Island and pipeline dredging for the Megayachts and inlet maintenance projects.

LAKE WORTH INLET SAND MANAGEMENT
PRELIMINARY ASSESSMENT
BASED ON MATERIAL QUALITY AND DISPOSAL SITE VOLUME PROJECTIONS

LOCATION	TOTAL MATERIAL VOLUME (cy)	PROPOSED BEACH FILL VOLUME	MEAN GRAIN SZ (mm)	% SILT/CLAY	% GRAVEL	PROPOSED LWWR FILL VOLUME	% SILT/CLAY	% GRAVEL	PROPOSED P.I. STORAGE VOLUME*	% SILT/CLAY	% GRAVEL	% ORGANICS
Peanut												
FIND site to +7' NGVD	537,191					537,191	4.3%	15.1%		15.0%	16.5%	
Port Site to +2' NGVD	413,523					413,523	3.0%	13.0%				
Restoration Features	284,608	99,856	0.37	2.3%	3.8%	99,298	4.1%	17.8%	85,454	14.0%	18.6%	
Megayacht calculated to 17' o.d. depth	636,111	210,648	0.17	3.6%	0.0%				425,463	5.2%	2.7%	5.7%
M.Y. Access Channels sediment characteristics unknown, volume calc. by USACE	473,658								473,658	?	?	?
Settlement Basin 1 67,500 sq ft x 12	30,000	30,000										
New Settlement Basin 100,000 sq ft x 20	74,074	74,074										
Entrance Channel 400x1600x3	71,111	71,111										
Inner Channel 300x2700x2	60,000	60,000										
Turning Basin 1550x1400x1	82,667								82,667			
Ext Turning Basin 650x500x1	12,037								12,037			

2,674,980

545,689

1,050,012

1,079,279

NOTES: 1. Volume to be removed from Peanut could be adjusted to meet requirements

2. Some access channel material may be beach compatible or used to fill other depressions

*May include other depression areas.



**Department of Environmental
Resources Management**

3323 Belvedere Road, Building 502

West Palm Beach, FL 33406-1548

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**Palm Beach County
Board of County
Commissioners**

Warren H. Newell, Chairman

Carol A. Roberts, Vice Chair

Karen T. Marcus

Mary McCarty

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Addie L. Greene

County Administrator

Robert Weisman

*"An Equal Opportunity
Affirmative Action Employer"*

October 12, 2001

Mr. Robert W. Paulson, Jr.
Jacksonville District Corps of Engineers
West Palm Beach Regulatory Office
400 N. Congress Ave., Ste. 130
West Palm Beach, FL 33401

Dear Bob:

**SUBJECT: CITY OF LAKE WORTH WETLAND RESTORATION
PROJECT, FILE #20002515 (IP-RM)**

This letter is a follow up to our August 29, 2001 meeting with staff from the National Marine Fisheries Service (NMFS), Habitat Conservation Division (HCD). The proposed modifications to the referenced project address the concerns raised by the HCD.

Two seagrass surveys have been conducted at the project site. The first survey occurred October 8, 1998. One person swam the entire length of the project looking for seagrass, while another recorded the observations communicated by the swimmer. The survey was completed in one day, and the results were published in the project's permit application.

At the request of HCD staff, a second seagrass survey was conducted on September 14 and 15, 2000. This survey occurred close to the end of the worst drought on record. Water quality and transparency were excellent due to the lack of freshwater discharges into the lagoon. This survey almost certainly represents the best coverage of seagrasses possible under current site conditions.

The original seagrass survey revealed that seagrasses occurred at depths between approximately -1.0 and -4.0 referenced to the National Geodetic Vertical Datum of 1929 (NGVD). A hydrographic survey of the site had previously been conducted, with depth data collected along 34 transects located 200 feet apart (Figure 1). These same transects were used for the 2000 seagrass survey so that coverages could easily be equated to approximate water depths.

A Trimble real time corrected differential global positioning system was used to place a buoy on each transect in approximately 3 feet of water. Two divers then surveyed the transect using a measuring tape to record

Mr. Robert W. Paulson, Jr.

Page 2

October 12, 2001

the distance of observed seagrasses from the buoy. The divers swam along each transect line, recording any seagrasses visible from the transect. Visibility ranged from approximately 1 to 3 feet during the two survey days. Data recorded included the distance from the buoy (both east and west), seagrass species present, and a subjective relative measure of coverage (sparse, medium, dense). Although much of the seagrass coverage could be characterized as patchy, this characterization was not used.

Table 1 summarizes the raw data from each transect. Table 2 is the spreadsheet used to calculate the estimated seagrass coverage at the project site. A total of 1.29 acres of seagrass cover was estimated at the project site, with *H. johnsonii* covering an estimated 0.92 acres. The relative densities of each seagrass area are ignored. It should be noted that a mixture of *H. johnsonii* and any other species was assumed to be *H. johnsonii*. This provided a conservative estimate of *H. johnsonii* cover. Figure 1 shows the seagrass transect data on an aerial of the project site.

Proposed Project Modification

HCD has objected to the seagrass impacts proposed by this project. Our original proposal included impacting virtually all of the seagrasses at the site based on the original seagrass survey (0.67 total acres, 0.27 acres of *H. johnsonii*). We concur with HCD's suggestion that a seed source be preserved within the project footprint to facilitate reestablishment of *H. johnsonii* after construction. We are proposing a project modification to avoid impacts to 0.71 acres (55.0%) of the total seagrass cover, including preservation of 0.65 acres (70.7%) of the existing *H. johnsonii* cover revealed during the September 2000 survey.

Figure 2 shows the proposed modifications to the project. The northern toe of fill was pulled back, and those seagrasses along transects 66+00 and 64+00 will be preserved. Seagrasses will also be preserved along transects 18+00, 16+00, 10+00, and 8+00. A total of 2.9 acres of existing bottom between -1.0 and -4.0 NGVD will be preserved under this proposal (Figure 2). Table 3 is the spreadsheet used to calculate the modified projects' proposed seagrass impacts.

In a December 1, 2000 letter to the Corps, HCD indicated concerns that this project would: 1) adversely impact Essential Fish Habitat (EFH), 2) have uncertain effects on adjacent seagrass beds and future seagrass recruitment, and 3) have adverse impacts to EFH resulting from non-water dependent components. HCD indicated that "there is no certainty that seagrasses will re-establish" after fill placement. They cite a number of factors that may preclude seagrass from regrowing at the site, including a lack of seed or vegetative growth source in the area, influences of freshwater outflow from the C-51 canal, and resuspension of existing fine sediments after placement of the new fill. HCD then recommended denial of the project as proposed.

The proposed modification should relieve the concerns raised by the HCD. The new plan will preserve 70.7% (0.65 acres) of existing *H. johnsonii* cover in three separate areas spread out along the project footprint. These areas will provide the seed source for reestablishment of *H. johnsonii* at the site after construction.

Mr. Robert W. Paulson, Jr.
Page 3
October 12, 2001

HCD's concern that freshwater discharges from the C-51 canal will prevent the regrowth of *H. johnsonii* (or other seagrass species) is unwarranted. Seagrasses are currently growing in this very environment, and there is no reason to believe they won't reestablish after construction of a project that will actually create a more hospitable environment. We have already proved that *H. johnsonii* is capable of reestablishing in a newly created environment through the Munyon Island restoration project.

HCD's concern that resuspension of fine sediments will prevent regrowth is also unwarranted. The proposed fill will have a lower percentage of fines than currently exist at the site. Moreover, resuspension of fine sediments is directly dependent upon wave energy. The proposed project's mangrove islands and oyster reefs (Figure 2) will provide a wavebreak along the entire shoreline. This will substantially reduce the wave energy that reaches the proposed seagrass recruitment areas, with a concomitant reduction in the resuspension of sediments at the site.

HCD also objected to the "non-water dependant" component of the original proposal (0.4 acres of golf tees). HCD staff indicated that if the golf tees were not removed, then the project would be recommended for denial. Period. No exceptions. We find this harsh position particularly disturbing. The project is proposed on 100 acres of privately owned submerged land. The City of Lake Worth (City) has title granted by a deed from the Trustees of the Internal Improvement Fund of the State of Florida. Should the City insist on having the tees (which represents only 0.4% of total fill impacts) in exchange for use of their land, the entire 100 acre restoration project would be compromised.

40 C.F.R § 230.10(a)(3) provides that where an activity "does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e. is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available." The City's requirement that the tees be included in exchange for use of their property for restoration purposes would render the tees water dependent within this definition. That is, the projects basic purpose (restoration) could not be fulfilled without the use of the special aquatic site in question (tees). Although § 230.10(a)(3) clearly would not presumptively preclude construction of the tees as HCD suggests, we recognize that compromises must sometimes be made to demonstrate good faith efforts for compliance with the law. We have modified the project to eliminate the golf tees, and expect that HCD will likewise make a good faith effort to recommend this project for approval.

It is our understanding that NMFS Protected Resources Division (PRD) has yet to review and comment on this proposal. We recognize that there will be temporary impacts to the threatened species *Halophila johnsonii*. Section 1536(a)(2) of the Endangered Species Act requires insurance that any action authorized by the agency is "not likely to jeopardize the continued existence of any endangered or threatened species," or result in the "destruction or adverse modification" of critical habitat. 50 C.F.R. § 402.02 defines "jeopardize the continued existence of" as an action that "reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood for both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species."

Mr. Robert W. Paulson, Jr.

Page 4

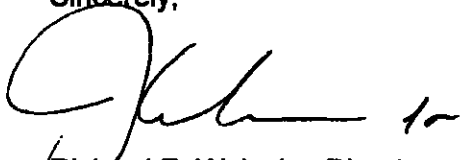
October 12, 2001

This project is specifically designed to increase directly the amount and quality of *H. johnsonii* habitat (as well as other diverse EFH resources) available at the project site. No designated critical habitat will be impacted. We expect any recommendation of denial by the PRD to be accompanied by a thorough and fact based explanation of how this project could possibly "reduce appreciably" the likelihood for both the survival and recovery of *Halophila johnsonii*. We do not believe such a good faith argument can be made.

Mitigation for project seagrass impacts at a 5:1 ratio is proposed. The proposed mitigation plan is outlined in the SFWMD permit special conditions attached to this correspondence.

It is the Corps' responsibility to decide whether a permit should be issued for this project. We understand the need for mutual cooperation between federal agencies. However, this project is too important for the future health and availability of EFH resources in the lagoon to be denied for the temporary impacts to EFH and to *H. johnsonii* as HCD suggests. We believe we have made the necessary modifications to the proposal that satisfy the concerns raised by the HCD, and ask that a decision on this permit be made as quickly as possible. We look forward to working with you to achieve successful project construction. If you have any further questions, feel free to contact me or Mr. David Carson at (561)233-2400. Thank you for your consideration of this matter.

Sincerely,



Richard E. Walesky, Director
Department of Environmental Resources Management

cc:

Rob Robbins

South Florida Water Management District

Andreas Mager, Jr.

Habitat Conservation Division

Georgia Cranmore

Protected Resources Division

James J. Slack

US Fish and Wildlife Service

Spencer Simon

US Fish and Wildlife Service

David K. Roach

Florida Inland Navigation District

John Jorgenson, P.A.

Scott/Harris

Jud Kenworthy

NOAA Beaufort Laboratory

SEPTEMBER 14-15, 2000

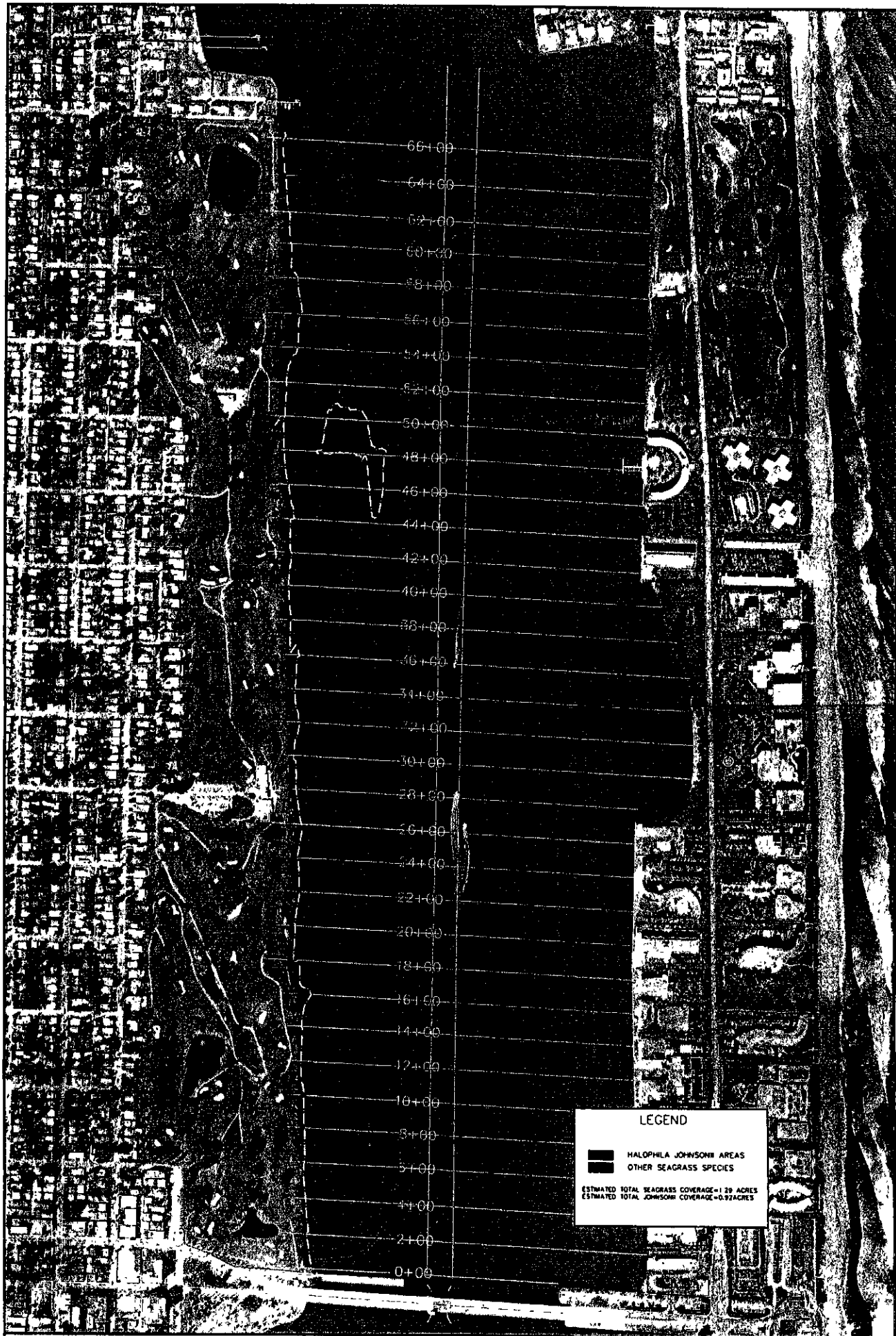
S=SPARSE; M=MEDIUM; D=DENSE
J=JOHNSONII, D=DECIPIENS

[illegible]

TRANSECT	TRANSECT LENGTH	PERCENT TRANSECT WIGGLASS	PERCENT TRANSECT JOHNSONII	AVG LENGTH B/W TRANSECTS (-1 to 4 NSVD)	DIST B/W TRANSECTS	AVG TOT ACRES BETWEEN TRANSECTS (-1 to 4 NSVD)	AVG % GRASS COVER (ALL SPECIES/ALL SPECIES)	EST TOTAL GRASS ACRES	AVG % JOHNSONII COVER	EST TOTAL JOHNSONII ACRES	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20	H21	H22	H23	H24	H25	H26	H27	H28	H29	H30	H31	H32	H33	H34	H35	H36	H37	H38	H39	H40	H41	H42	H43	H44	H45	H46	H47	H48	H49	H50	H51	H52	H53	H54	H55	H56	H57	H58	H59	H60	H61	H62	H63	H64	H65	H66	H67	H68	H69	H70	H71	H72	H73	H74	H75	H76	H77	H78	H79	H80	H81	H82	H83	H84	H85	H86	H87	H88	H89	H90	H91	H92	H93	H94	H95	H96	H97	H98	H99	H100	H101	H102	H103	H104	H105	H106	H107	H108	H109	H110	H111	H112	H113	H114	H115	H116	H117	H118	H119	H120	H121	H122	H123	H124	H125	H126	H127	H128	H129	H130	H131	H132	H133	H134	H135	H136	H137	H138	H139	H140	H141	H142	H143	H144	H145	H146	H147	H148	H149	H150	H151	H152	H153	H154	H155	H156	H157	H158	H159	H160	H161	H162	H163	H164	H165	H166	H167	H168	H169	H170	H171	H172	H173	H174	H175	H176	H177	H178	H179	H180	H181	H182	H183	H184	H185	H186	H187	H188	H189	H190	H191	H192	H193	H194	H195	H196	H197	H198	H199	H200	H201	H202	H203	H204	H205	H206	H207	H208	H209	H210	H211	H212	H213	H214	H215	H216	H217	H218	H219	H220	H221	H222	H223	H224	H225	H226	H227	H228	H229	H230	H231	H232	H233	H234	H235	H236	H237	H238	H239	H240	H241	H242	H243	H244	H245	H246	H247	H248	H249	H250	H251	H252	H253	H254	H255	H256	H257	H258	H259	H260	H261	H262	H263	H264	H265	H266	H267	H268	H269	H270	H271	H272	H273	H274	H275	H276	H277	H278	H279	H280	H281	H282	H283	H284	H285	H286	H287	H288	H289	H290	H291	H292	H293	H294	H295	H296	H297	H298	H299	H300	H301	H302	H303	H304	H305	H306	H307	H308	H309	H310	H311	H312	H313	H314	H315	H316	H317	H318	H319	H320	H321	H322	H323	H324	H325	H326	H327	H328	H329	H330	H331	H332	H333	H334	H335	H336	H337	H338	H339	H340	H341	H342	H343	H344	H345	H346	H347	H348	H349	H350	H351	H352	H353	H354	H355	H356	H357	H358	H359	H360	H361	H362	H363	H364	H365	H366	H367	H368	H369	H370	H371	H372	H373	H374	H375	H376	H377	H378	H379	H380	H381	H382	H383	H384	H385	H386	H387	H388	H389	H390	H391	H392	H393	H394	H395	H396	H397	H398	H399	H400	H401	H402	H403	H404	H405	H406	H407	H408	H409	H410	H411	H412	H413	H414	H415	H416	H417	H418	H419	H420	H421	H422	H423	H424	H425	H426	H427	H428	H429	H430	H431	H432	H433	H434	H435	H436	H437	H438	H439	H440	H441	H442	H443	H444	H445	H446	H447	H448	H449	H450	H451	H452	H453	H454	H455	H456	H457	H458	H459	H460	H461	H462	H463	H464	H465	H466	H467	H468	H469	H470	H471	H472	H473	H474	H475	H476	H477	H478	H479	H480	H481	H482	H483	H484	H485	H486	H487	H488	H489	H490	H491	H492	H493	H494	H495	H496	H497	H498	H499	H500	H501	H502	H503	H504	H505	H506	H507	H508	H509	H510	H511	H512	H513	H514	H515	H516	H517	H518	H519	H520	H521	H522	H523	H524	H525	H526	H527	H528	H529	H530	H531	H532	H533	H534	H535	H536	H537	H538	H539	H540	H541	H542	H543	H544	H545	H546	H547	H548	H549	H550	H551	H552	H553	H554	H555	H556	H557	H558	H559	H560	H561	H562	H563	H564	H565	H566	H567	H568	H569	H570	H571	H572	H573	H574	H575	H576	H577	H578	H579	H580	H581	H582	H583	H584	H585	H586	H587	H588	H589	H590	H591	H592	H593	H594	H595	H596	H597	H598	H599	H600	H601	H602	H603	H604	H605	H606	H607	H608	H609	H610	H611	H612	H613	H614	H615	H616	H617	H618	H619	H620	H621	H622	H623	H624	H625	H626	H627	H628	H629	H630	H631	H632	H633	H634	H635	H636	H637	H638	H639	H640	H641	H642	H643	H644	H645	H646	H647	H648	H649	H650	H651	H652	H653	H654	H655	H656	H657	H658	H659	H660	H661	H662	H663	H664	H665	H666	H667	H668	H669	H670	H671	H672	H673	H674	H675	H676	H677	H678	H679	H680	H681	H682	H683	H684	H685	H686	H687	H688	H689	H690	H691	H692	H693	H694	H695	H696	H697	H698	H699	H700	H701	H702	H703	H704	H705	H706	H707	H708	H709	H710	H711	H712	H713	H714	H715	H716	H717	H718	H719	H720	H721	H722	H723	H724	H725	H726	H727	H728	H729	H730	H731	H732	H733	H734	H735	H736	H737	H738	H739	H740	H741	H742	H743	H744	H745	H746	H747	H748	H749	H750	H751	H752	H753	H754	H755	H756	H757	H758	H759	H760	H761	H762	H763	H764	H765	H766	H767	H768	H769	H770	H771	H772	H773	H774	H775	H776	H777	H778	H779	H780	H781	H782	H783	H784	H785	H786	H787	H788	H789	H790	H791	H792	H793	H794	H795	H796	H797	H798	H799	H800	H801	H802	H803	H804	H805	H806	H807	H808	H809	H810	H811	H812	H813	H814	H815	H816	H817	H818	H819	H820	H821	H822	H823	H824	H825	H826	H827	H828	H829	H830	H831	H832	H833	H834	H835	H836	H837	H838	H839	H840	H841	H842	H843	H844	H845	H846	H847	H848	H849	H850	H851	H852	H853	H854	H855	H856	H857	H858	H859	H860	H861	H862	H863	H864	H865	H866	H867	H868	H869	H870	H871	H872	H873	H874	H875	H876	H877	H878	H879	H880	H881	H882	H883	H884	H885	H886	H887	H888	H889	H890	H891	H892	H893	H894	H895	H896	H897	H898	H899	H900	H901	H902	H903	H904	H905	H906	H907	H908	H909	H910	H911	H912	H913	H914	H915	H916	H917	H918	H919	H920	H921	H922	H923	H924	H925	H926	H927	H928	H929	H930	H931	H932	H933	H934	H935	H936	H937	H938	H939	H940	H941	H942	H943	H944	H945	H946	H947	H948	H949	H950	H951	H952	H953	H954	H955	H956	H957	H958	H959	H960	H961	H962	H963	H964	H965	H966	H967	H968	H969	H970	H971	H972	H973	H974	H975	H976	H977	H978	H979	H980	H981	H982	H983	H984	H985	H986	H987	H988	H989	H990	H991	H992	H993	H994	H995	H996	H997	H998	H999	1000
8	44	0.45	0.45	34.5	200	0.18	0.25	0.04	0.23	0.04																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

TABLE 3. ESTIMATED TOTAL SEAGRASS IMPACTS

[illegible]



PALM BEACH COUNTY
DEPARTMENT OF
ENVIRONMENTAL
RESOURCES
MANAGEMENT

FIGURE 1
CITY OF LAKE WORTH WETLAND
RESTORATION PROJECT
2000 SEAGRASS SURVEY DATA

SCALE.
1 INCH = 500 FEET



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5312; FAX 570-5517
<http://caldera.sero.nmfs.gov>

MAY 22 2002

F/SER3:BH:egh

Mr. James C. Duck
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

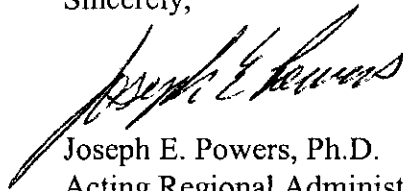
Dear Mr. Duck:

This constitutes the National Marine Fisheries Service's (NMFS) biological opinion (Opinion) based on our review of the removal of stored dredge material from Peanut and John's Islands and its use in the Lake Worth Lagoon Wetlands Restoration, Palm Beach County, Florida, and their effects on Johnson's seagrass (*Halophila johnsonii*) in accordance with section 7 of the Endangered Species Act (ESA) of 1973 as amended. You requested formal ESA section 7 consultation on August 24, 2000.

This Opinion is based on information provided in your August 24, 2000, letter; a subsequent letter from your office dated November 8, 2001; a public notice dated November 30, 2001; information from Palm Beach County dated October 21, 2001; and information received from Palm Beach County via e-mail on January 18, 2002. NMFS initiated formal consultation following receipt of the January 18, 2002, e-mail information. A complete administrative record of this consultation is on file at the NMFS, Southeast Regional Office (Consultation Number F/SER/2001/01187).

We look forward to further cooperation with you on other Corps of Engineers projects to ensure the conservation and recovery of our threatened and endangered marine species.

Sincerely,



Joseph E. Powers, Ph.D.
Acting Regional Administrator

Enclosures (2)

cc: FHWA, FDOT, F/PR

o:\section7\formal\lwrrp.wpd
File: 1514-22.1



Endangered Species Act - Section 7 Consultation

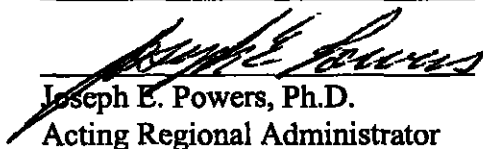
Agency: United States Army Corps of Engineers, Jacksonville District

Activity: The Removal of Stored Dredge Material on Peanut Island and Its Use in the Lake Worth Lagoon Wetlands Restoration, Palm Beach County, Florida (F/SER/2001/01187)

Consultation Conducted By: National Marine Fisheries Service, Southeast Region

Date Issued:

Approved By:


Joseph E. Powers, Ph.D.
Acting Regional Administrator

This constitutes the National Marine Fisheries Service's (NMFS) biological opinion (Opinion) based on our review of the removal of stored dredge material from Peanut and John's Islands and its use in the Lake Worth Lagoon Wetlands Restoration, Palm Beach County, Florida, and their effects on Johnson's seagrass (*Halophila johnsonii*) in accordance with section 7 of the Endangered Species Act (ESA) of 1973 as amended. You requested formal ESA section 7 consultation on August 24, 2000.

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Consultation History

The Corps of Engineers (COE) initiated consultation with NMFS in a letter dated August 24, 2000 and a follow-up letter dated November 8, 2000; however, the COE was in consultation with the NMFS Southeast Regional Office's (SERO) Habitat Conservation Division (HCD) for the proposed action's effects on essential fish habitat (EFH), not its effects on federally listed species. HCD objected to many of the provisions of the proposed action and was attempting to negotiate changes in the proposed action to limit its effects on EFH. NMFS SERO Protected Resources Division (PRD) decided to delay the completion of ESA section 7 consultation until

HCD had completed its EFH consultation and the COE and Palm Beach County prepared a final proposed action. NMFS SERO PRD received the finalized proposed action via e-mail from Palm Beach County on January 18, 2002.

BIOLOGICAL OPINION

I. Description of the Proposed Action

The proposed project involves moving approximately 1,000,000 cubic yards of spoil material from upland sites to the action area. The spoil material will come from existing stockpiles of material at Peanut Island and John's Island (Figure 1). Ninety-eight percent of the material will come from Peanut Island.

Peanut Island has an off-loading facility constructed on the southwest side of the island. The facility includes a seawall and staging area to allow a barge to pull up to the island and easily take on spoil material for transport. A haul road also exists allowing heavy equipment access to the spoil storage areas on the island. A 1-foot contour chart is provided in Figure 2, demonstrating approximate water depths in the off-loading area.

When the tug and barge dock at the Peanut Island off-loading facility, the tug will remain on the edge of the port turning basin in approximately 20 feet of water. The barge will arrive and depart the docking facility in the same manner each trip. Because of the depth of water maintained under the tug, the applicant anticipates no damage to submerged resources from fill off-loading operations at Peanut Island.

John's Island will be accessed at two sites along the western shore (Figure 3). A shallow-draft tug and barge will be used to remove and transport the fill from John's Island. The tug and barge will draft a maximum of 4 feet of water. A 1-foot contour chart is provided in Figure 3.

Because of the shallow depths along the edge of the island, it may be necessary to temporarily beach a small barge at high tide at the access site to act as a "finger pier." The working tug and barge would then dock on the west end of the beached barge, leaving the working barge with enough water for ingress and egress. Heavy equipment would then cross the beached barge, and load material onto the working barge. Alternatively, a temporary ramp system may be constructed to span the shallow water and allow equipment to reach the working tug and barge.

The entire area from the western shore of John's Island out into the Intracoastal Waterway (ICW) channel consists of an outcrop of Anastasia limestone rock. No seagrasses are present in the area due to the rock substrate. The applicant anticipates no detrimental impacts to submerged resources as a result of tug and barge ingress or egress.

A large, deep-draft tug and barge (maximum draft 6-7 feet) will be used to transport the large volume of material from Peanut Island. At the beginning of construction, the material on the deep draft barge can be off-loaded directly into the dredged hole at the action area. However, once rough grade elevations are approached, the deep-draft tug and barge will be restricted by the shallow grades. At that point, the remaining material will be transferred from the larger vessel to a shallow draft vessel for final grading.

Once the material has been transported to the project site, design specifications require grading the material to shallow inter- and sub-tidal elevations. By necessity, a shallow draft (maximum draft 4-5 feet) tug and barge will be required to work in and around these shallow areas.

Depths at the action area are currently sufficient to accommodate either the deep-draft or shallow-draft barge. Figure 4 shows the tentative barge access sites in the action area. The current submerged resources (seagrasses) are located in a narrow band along the existing shoreline. The COE plans to fill over this band of seagrasses in order to reestablish a gradual littoral slope. Approximately 2.9 acres of seagrass near the action area will be surrounded by turbidity curtains to protect it from disturbance by construction. The barge access areas are outside of the seagrass areas.

Mitigative Measures

Monitoring of the project and mitigation areas will be conducted annually for five years following construction. Fixed transect vegetative and photo sampling will be conducted. A typical plan view with associated transects is shown in Figure 5. The success of all habitat types (mangrove, seagrass, and oyster reefs) will be monitored. Fish and wildlife utilization will also be recorded.

Monitoring will be continued on a periodic basis in perpetuity as a consequence of general department policy regarding construction of environmental enhancement projects. The project will be maintained free of exotics in perpetuity.

Palm Beach County expects to see evidence of seagrass recruitment within this area in the first or second year following construction. If seagrass recruitment occurs over 30 percent of the required mitigation area by the second year, no immediate action will be taken beyond continued monitoring. If natural recruitment over 30 percent of the required area is not accomplished by the third year, it is proposed to transplant *Halodule wrightii* at the site. If 1 acre of seagrass is impacted by the project, one acre of *Halodule* planting would be executed. Transplanting would be intended to accelerate successful seagrass establishment.

The seagrass mitigation will be deemed successful when 2.9 acres of seagrass of at least 30 percent density per square meter persists for two of the five annual monitoring reports. Monitoring will continue for five years. Once the successful mitigation area has been identified, a conservation easement will be executed to cover the appropriate areas.

Action Area

Lake Worth Lagoon, Palm Beach County, Florida, Latitude 26°37'30" North, Longitude 80°02'44" West.

II. Status of the Species

The following endangered (E) and threatened (T) marine mammal, sea turtle, and marine plant species under the jurisdiction of NMFS are known to occur in or near the action area:

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Johnson's seagrass	<i>Halophila johnsonii</i>	T
Loggerhead sea turtle	<i>Caretta caretta</i>	T
Green sea turtle	<i>Chelonia mydas</i>	E/T*
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	E
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	E
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E
Right whale	<i>Eubalaena glacialis</i>	E
Humpback whale	<i>Megaptera novaeangliae</i>	E

* Green turtles in U.S. waters are listed as threatened except for the Florida breeding population, which is listed as endangered. Due to the inability to distinguish between the populations away from the nesting beaches, green turtles are considered endangered wherever they occur in U.S. waters.

Although sea turtles may be present in the vicinity of the action area, NMFS does not expect that the five above-listed sea turtle species will be adversely affected by the proposed action. The proposed construction methods (hopper dredges and explosives will not be used) have not been shown to adversely affect sea turtles. Any effects of noise, disturbance, reduced water clarity, and movements of boats and equipment associated with the proposed action are expected to be insignificant and temporary in nature and therefore not likely to result in any adverse effects to sea turtles.

The two species of endangered marine mammals listed above—the humpback whale and the right whale—may be found seasonally in inshore waters of the southeastern United States but are extremely unlikely to occur in the action area. For the reasons given above for sea turtles, these marine mammal species are also not expected to be adversely affected by the action. Since NMFS has determined that the sea turtles and marine mammals listed above are not likely to be adversely affected by the proposed action, these species will not be considered further in this

Opinion. The remainder of this opinion will focus on the only federally listed species likely to be adversely affected by the proposed action, Johnson's seagrass.

Johnson's Seagrass (*Halophila johnsonii*)

A. Species Description

Johnson's seagrass was listed as threatened under the ESA on September 14, 1998, based on the results of field work and a status review initiated in 1990. Johnson's seagrass is the first marine plant ever listed under the ESA. Kenworthy (1993, 1997, 1999) discusses the results of the field studies and summarizes an extensive literature review and associated interviews regarding the status of Johnson's seagrass. The following discussion summarizes those findings relevant to our evaluation of the proposed action.

Range

Johnson's seagrass has only been found growing along approximately 200 km of coastline in southeastern Florida between Sebastian Inlet, Indian River County, to northern Key Biscayne. This narrow range and apparent endemism suggests that Johnson's seagrass may have the most limited known geographic distribution of any seagrass in the world.

Johnson's seagrass occurs in dynamic and disjunct patches throughout its range. Growth appears to be rapid and leaf pairs have short life spans while horizontally spreading from dense apical meristems (Kenworthy, 1997). Kenworthy suggested that the observed horizontal spreading, rapid growth patterns, and high biomass turnover could explain the dynamic patches observed in distribution studies of this species. New information reviewed in Kenworthy (1999, 1997) confirms *H. johnsonii*'s limited geographic distribution in patchy and vertically disjunct areas between Sebastian Inlet and northern Biscayne Bay. Surveys conducted by NMFS and Florida Marine Research Institute staff in Biscayne Bay, Florida Bay, the Florida Keys, outer Florida Bay, Puerto Rico, and the Virgin Islands have provided no verifiable sightings of Johnson's seagrass outside of the range already reported.

Extent of critical habitat

The northern and southern ranges of Johnson's seagrass are defined as Sebastian Inlet and central Biscayne Bay, respectively. These limits to the species' range have been designated as critical habitat for Johnson's seagrass (May 5, 2000; 65 FR 17786). The designation of critical habitat provides explicit notice to Federal agencies and the public that these areas and features are vital to the conservation of the species. Within its range, Johnson's seagrass critical habitat has been designated for 10 areas: a portion of the Indian River Lagoon, north of the Sebastian Inlet Channel; a portion of the Indian River Lagoon, south of the Sebastian Inlet Channel; a portion of the Indian River Lagoon near the Fort Pierce Inlet; a portion of the Indian River Lagoon, north of the St. Lucie Inlet; a portion of Hobe Sound; a site on the south side of Jupiter Inlet; a site in central Lake Worth Lagoon; a site in Lake Worth Lagoon, Boynton Beach; a site in Lake Wyman, Boca Raton; and a portion of Biscayne Bay. Based on the best available

information, NMFS identified the following physical and biological features as those constituent elements which are essential to the conservation of Johnson's seagrass: adequate water quality, salinity levels, water transparency, and stable, unconsolidated sediments that are free from physical disturbance. The specific areas designated as critical habitat which are currently occupied by Johnson's seagrass include one or more of the following criteria: 1) locations with populations that have persisted for 10 years; 2) locations with persistent flowering populations; 3) locations at the northern and southern range limits of the species; 4) locations with unique genetic diversity; and 5) locations with a documented high abundance of Johnson's seagrass compared to other areas in the species range.

B. Life History

Reproductive strategy

The species is perennial and may spread even during winter months under favorable conditions (Virstein *et al.*, 1997). Sexual reproduction in Johnson's seagrass has not been documented. Female flowers have been found; however, dedicated surveys in the Indian River Lagoon have not discovered male flowers, fertilized ovaries, fruits, or seeds either in the field or under laboratory conditions (Jewett-Smith *et al.*, 1997). Searches throughout the range of Johnson's seagrass have produced the same results, suggesting that the species does not reproduce sexually or that the male flowers are difficult to observe or describe, as noted for other *Halophila* species (Kenworthy, 1997). Surveys to date indicate that the incidence of female flowers appears to be much higher near the inlets leading to the Atlantic Ocean, suggesting that inlet conditions are qualitatively better for flowering than conditions further inshore (Kenworthy, pers. comm. 1998). It is possible that male flowers, if they exist, occur near inlets as well. Maintenance of good water quality around inlets may be essential for promoting flowering in the Johnson's seagrass population.

Niche

The essential features of habitat appear to be adequate water quality, salinity, water clarity, and stable sediments free from physical disturbance. Important habitat characteristics include shallow intertidal as well as deeper subtidal zones (2-5 m). Water transparency appears to be critical for Johnson's seagrass, limiting its distribution at depth to areas of suitable optical water quality (Kenworthy, 1997). In areas in which long-term poor water and sediment quality have existed until recently, such as Lake Worth Lagoon, *H. johnsonii* appears to occur in relatively higher abundance perhaps due to the previous inability of the larger species to thrive. These studies support unconfirmed previous observations that suspended solids and tannin, which reduce light penetration and water clarity, may be important factors limiting seagrass distribution in the Indian River Lagoon (Woodward-Clyde, 1994). Good water clarity is essential for *Halophila johnsonii* growth in deeper waters.

Johnson's seagrass occurs over varied depths, environmental conditions, salinities, and water quality. In tidal channels *H. johnsonii* is found in coarse sand substrates, although it has been found growing on sandy shoals, and in soft mud near canals and rivers where salinity may

fluctuate widely (Virnstein *et al.*, 1997). Virnstein has called Johnson's seagrass a "perennial opportunistic species." Within his study areas in the Indian River Lagoon, *H. johnsonii* was found by itself, with other seagrass species, in the intertidal, and (more commonly) at the deep edge of some transects in water depths of up to 180 cm. *H. johnsonii* was found shallowly rooted on sandy shoals, in soft mud, near the mouths of canals, rivers, and in shallow and deep water (Virnstein *et al.*, 1997). Additionally, recent studies have documented large patches of Johnson's seagrass on flood deltas just inside Sebastian Inlet, as well as far from the influence of inlets (reported at the workshop discussed in Kenworthy, 1997). These sites encompass a wide variety of salinities, water quality, and substrates.

Competitors

Halophila johnsonii appears to be out-competed in ideal seagrass habitats where environmental conditions permit the larger species to thrive (Virnstein *et al.*, 1997; Kenworthy, 1997).

C. Population Dynamics

Population stability

A factor leading to the listing of *H. johnsonii* is its rareness within its extremely restricted geographic range. Johnson's seagrass is characterized by small size (it is the smallest of all of the seagrasses found within its range, averaging about 3 cm in height), fragile rhizome structure and associated high turnover rate, and its apparent reliance on vegetative means to reproduce, grow, and migrate across the sea bottom. These factors make Johnson's seagrass extremely vulnerable to human or environmental impacts by reducing its capacity to repopulate an area once removed. The species and its habitat are impacted by human-related activities throughout the length of its range, including bridge construction and dredging, and the species' threatened status produces new and unique challenges for the management of shallow submerged lands. Vessel traffic resulting in propeller and anchor damage, maintenance dredging, dock and marine construction, water pollution, and land use practices could require special management within critical habitat.

Population (genetic) variability

The Boca Raton and Boynton Beach sites which have been designated as critical habitat have populations which are distinguished by a higher index of genetic variation than any of the central and northern populations examined to date (Kenworthy, 1999). These two sites represent a genetically semi-isolated group which could be the reservoir of a large part of the overall genetic variation found in the species. Information is still lacking on the geographic extent of this genetic variability.

D. Status and Distribution

Reasons for listing

Kenworthy (1997, 1999) summarized the newest information on Johnson's seagrass biology, distribution and abundance, and confirmed the limited range and rareness of this species within

its range. Additionally, the apparent restriction of propagation through vegetative means suggests that colonization between broadly disjunct areas is likely difficult, suggesting that the species is vulnerable to becoming endangered if it is removed from large areas within its range by natural or anthropogenic means. Human impacts to Johnson's seagrass and its habitat include: (1) vessel traffic and the resulting propeller dredging and anchor mooring; (2) dredging; (3) dock and marina construction and shading from these structures; (4) water pollution; and (5) land use practices including shoreline development, agriculture, and aquaculture.

Activities associated with recreational boat traffic account for the majority of human use associated with the designated critical habitat areas. The destruction of the benthic community due to boating activities, propeller dredging, anchor mooring, and dock and marina construction was observed at all sites during a study by NMFS from 1990 to 1992. These activities severely disrupt the benthic habitat, breaching root systems, severing rhizomes, and significantly reducing the viability of the seagrass community. Propeller dredging and anchoring in shallow areas are a major disturbance to even the most robust seagrasses. This destruction is expected to worsen with the predicted increase in boating activity. Trampling of seagrass beds, a secondary effect of recreational boating, also disturbs seagrass habitat. Populations of Johnson's seagrass inhabiting shallow water and close to inlets, where vessel traffic is concentrated, will be most affected.

The constant sedimentation patterns in and around inlets require frequent maintenance dredging, which could either directly remove essential seagrass habitat or indirectly affect it by redistributing sediments, burying plants, and destabilizing the bottom structure. Altering benthic topography or burying the plants may remove them from the photic zone. Permitted dredging of channels, basins, and other in- and on-water construction projects causes loss of Johnson's seagrass and its habitat through direct removal of the plant, fragmentation of habitat, and shading. Docking facilities that, upon meeting certain provisions, are exempt from state permitting also contribute to loss of Johnson's seagrass through construction impacts and shading. Fixed add-ons to exempt docks (such as finger piers, floating docks, or boat lifts) have recently been documented as an additional source of seagrass loss due to shading (Smith and Mezich, 1999).

Decreased water transparency caused by suspended sediments, water color, and chlorophylls could have significant detrimental effects on the distribution and abundance of the deeper water populations of Johnson's seagrass. A distribution survey in Hobe and Jupiter Sounds indicates that the abundance of this seagrass diminishes in the more turbid interior portion of the lagoon where reduced light limits photosynthesis.

Other areas of concern include seagrass beds located in proximity to rivers and canal mouths where low salinity, highly colored water is discharged. Freshwater discharge into areas adjacent to seagrass beds may provoke physiological stress upon the plants by reducing the salinity levels. Additionally, colored waters released into these areas reduce the amount of sunlight available for photosynthesis by rapidly attenuating shorter wavelengths of Photosynthetically Active Radiation.

Continuing and increasing degradation of water quality due to increased land use and water management threatens the welfare of seagrass communities. Nutrient overenrichment caused by inorganic and organic nitrogen and phosphorous loading via urban and agricultural land run-off stimulates increased algal growth that may smother Johnson's seagrass, shade rooted vegetation, and diminish the oxygen content of the water. Low oxygen conditions have a demonstrated negative impact on seagrasses and associated communities.

Range-wide trend

Lamentably, there is currently insufficient information to clearly determine trends in the Johnson's seagrass population, which was first described in 1980 and has only been extensively studied during the 1990s. Generally, seagrasses within the range of Johnson's seagrass have declined in some areas and increased in others. Where multi-year mapping studies have been conducted within the Indian River Lagoon, recent increases in Johnson's seagrass have been noted but may be attributed in part to the recent increase in search effort and increased familiarity with this species (Virnstein *et al.*, 1997). The authors conclude that from 1994 through 1997, no strong seasonal distribution or increases or decreases in abundance or range can be discerned.

E. Analysis of the Species Likely to be Affected

Of the listed species under NMFS jurisdiction occurring in the Atlantic Ocean in the Southeast Region, NMFS believes that only Johnson's seagrass may be adversely affected by the proposed action. *Halophila johnsonii* may be affected because of its limited range, distribution within its range, reproductive capacity, and largely unknown ability to recover from removal from a site. Spread of the species into new areas is limited by its reproductive potential. Johnson's seagrass is thought to possess only female flowers; thus, vegetative propagation, most likely through asexual branching, appears to be its only means of reproduction and dispersal. If an established community is disturbed, the extent of regrowth and reestablishment, if any, are uncertain. If extirpated from an area, it is doubtful that the species would be capable of repopulation. This species' method of reproduction impedes the ability to increase distribution as establishment of new vegetation requires considerable stability in environmental conditions and protection from human-induced disturbances.

III. Environmental Baseline

A. Status of the Species Within the Action Area

The range-wide status of the species, given in Section II above, most appropriately reflects the species status within the action area.

B. Factors Affecting the Species Environment Within the Action Area

This seagrass occurs within inshore waters of the most populated counties in Florida, and is therefore influenced by numerous actions and potential sources of harm. Since 1981, the state of

Florida has regulated activities that affect seagrasses and has implemented measures to minimize these effects. These protective measures directly benefit Johnson's seagrass.

Inlets into the ICW have been established or stabilized and maintained since the early 1900s, in some cases creating a marine environment where freshwater once occurred. Naturally-occurring channels have been expanded, deepened, and stabilized into continuous channels with access to harbors and inlets. These activities have had a dominant effect on the seagrass habitat throughout the range of *H. johnsonii*.

Urban development since the 1960s has affected inshore water quality throughout the range of Johnson's seagrass. However, Woodward-Clyde (1994) opined that improvements in erosion and sediment control in association with urban development in the 1980s and 1990s may have been responsible for reduced turbidity in those decades as compared to the previous two decades of development. Reductions in seagrasses were apparent in the 1970s, along with areas of highly turbid water. Increases in submersed aquatic vegetation were noted until coverage and density peaked in 1986, albeit at levels remaining below those observed in the decades prior to 1960.

In association with upland development, water quality and transparency within the range of Johnson's seagrass are affected by storm water and agricultural runoff, wastewater discharges, and other point and non-point sources. The effects of water management may result in large discharges of fresh water from Lake Okeechobee. Nutrient overenrichment resulting from these discharges may stimulate increased algal growth that may smother seagrasses, shade rooted vegetation, and diminish the oxygen content of the water. Water clarity, which has been identified as an essential feature to allow Johnson's seagrass to occur in the deeper reaches of its range, may also be affected by these discharges. Although Johnson's seagrass has shown tolerance of wide salinity ranges, the discharge of large amounts of fresh water into the ICW may exceed even these ranges.

Increasing recreational vessel traffic in the range of Johnson's seagrass results in marina and dock construction, anchor mooring, propeller scoring and scouring by vessels operating outside of boat channels, and intentional, illegal propeller dredging. Additionally, seagrass beds may be trampled by fishermen and others using these inshore waters. These activities disrupt the benthic habitat, and easily breach the shallow root systems of Johnson's seagrass.

Natural disasters, including hurricanes and large coastal storms, could also significantly harm seagrass beds. Storm surges could easily pull the shallowly-rooted *H. johnsonii* from the sediments and remove a large portion of its population in proximity to inlets. Because of its restricted geographic distribution and apparent reliance on asexual reproduction, it is less likely to survive environmental perturbations and to be able to repopulate an area when lost.

A wide range of activities funded, authorized, or carried out by Federal agencies may affect the essential habitat requirements of Johnson's seagrass. These include authorization by the COE for beach nourishment, dredging, and related activities including construction of docks and marinas;

bridge construction projects funded by the Federal Highways Administration; actions by the Environmental Protection Agency and the COE to manage freshwater discharges into waterways; regulation of vessel traffic by the U.S. Coast Guard (USCG); management of national refuges and protected species by the U.S. Fish and Wildlife Service; management of vessel traffic (and other activities) by the U.S. Navy; authorization of state coastal zone management plans by National Oceanic and Atmospheric Administration's National Ocean Service; and management of commercial fishing and protected species by NMFS.

Summary and Synthesis of the Environmental Baseline

In summary, several factors are presently adversely affecting Johnson's seagrass within the action area. These factors are ongoing and are expected to occur contemporaneously with the proposed action:

- the creation, widening, and deepening of inlets and channels will continue to fragment, smother, and directly remove seagrass beds;
- urban development will continue to create demands for new docks and marinas which will preclude the expansion of seagrasses by direct displacement and shading;
- upland development and associated runoff will continue to degrade water quality and decrease water clarity necessary for growth of seagrasses; and
- increased vessel traffic will continue to result in fragmentation of seagrass beds due to accidental groundings and propeller scarring.

These activities are expected to combine to adversely affect the recovery of Johnson's seagrass throughout its range.

IV. Effects of the Action

The proposal to list Johnson's seagrass as a threatened species identified a number of human and natural perturbations which adversely affect the species including 1) dredging and filling, 2) propeller scarring, 3) storm surge, 4) alterations in water quality, and 5) siltation. Due to the fragile nature of *H. johnsonii*'s shallow root system, these seagrasses are vulnerable to human-induced disturbances in addition to the major natural disturbances to the sediment.

Based on seagrass surveys completed by Palm Beach County, approximately 0.58 acre of sparse to moderate seagrass coverage is expected to be impacted as a result of project construction, of this 0.25 acre is Johnson's seagrass. The COE and Palm Beach County believe that when the project is completed upwards of 2.9 acres of sparse to moderate seagrasses (comparable to existing densities) will recruit to the project area within three years of project construction. They expect the species composition of the area to be similar to that currently present (*Halodule*

wrightii, *Halophila johnsonii*, and *Halophila decipiens*). However, NMFS cannot use uncertain future best-case expectations of seagrass recruitment when determining an action's effects on Johnson's seagrass and considers the loss of the 0.25 acre a permanent loss.

The area of the proposed action is in the mid-portion of the range of Johnson's seagrass. There are no detailed baseline distribution estimates on the amount of Johnson's seagrass throughout its range, including the mid-portion. The total range of this species is believed to be limited to only 200 km of eastern Florida coastline from Sebastian Inlet south to northern Biscayne Bay. Almost 19,000 acres of critical habitat have been designated for Johnson's seagrass to help preserve the species. *The proposed action is not within the boundaries of this critical habitat. Therefore,* NMFS believes that the loss of up to 0.25 acre of Johnson's seagrass from the action area is not likely to appreciably reduce the numbers, distribution, or reproduction of Johnson's seagrass in a way which would reduce its ability to remain viable throughout its range.

V. Cumulative Effects

Cumulative effects include the effects of future state, tribal, or local private actions that are reasonably certain to occur in the action area considered in this Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

No effects beyond those already described in Sections IIIB and IV are expected in the action area. Dock and marina construction will likely continue at current rates, with concomitant loss and degradation of seagrass habitat, including Johnson's seagrass; however, these activities are subject to COE permitting and thus the ESA section 7 consultation requirement. Furthermore, NMFS and the COE are working on guidelines to mandate the use of light-transmitting materials in future constructions of single-family docks within the range of Johnson's seagrass.

In or near the action area it is expected that recreational watercraft use will continue to increase; however, it is expected that boater education programs and posted signage about the dangers to seagrass beds (and manatees) of propeller scarring will reduce boat interactions with listed species at a rate greater than the increase in boating activity. NMFS does not believe that continuation of recreational boating activities at the current rate of increase will jeopardize the existence of *Halophila johnsonii* because of boater education programs and because of the designation of critical habitat for the species. This designation will help protect areas with persistent patches (patches that have been viable for at least 10 years), and areas of genetic variability, from adverse modifications.

Integration and Synthesis of Effects

The effects of construction, turbidity, shading, and filling from activities associated with the proposed action are expected to cause the permanent removal of 0.25 acre of Johnson's seagrass from the action area. It is expected that the Johnson's seagrass not directly removed from the

action area will continue to exist in its current form. The Johnson's seagrass remaining in the area is expected to persist and remain viable, with the potential to expand to the north and south of the action area as well as back into the action area itself, after construction. NMFS expects that additional seagrass beds occurring in other areas adjacent to the action area will not be adversely affected. This, combined with the presence of seagrass beds in other parts of Lake Worth Lagoon, including those designated as critical habitat, lead NMFS to conclude that the projected loss of up to 0.25 acre associated with the proposed action is not likely to appreciably reduce the numbers, distribution, or reproduction of Johnson's seagrass in the wild.

Projects such as the proposed action contribute to the environmental baseline for the species because of direct removal and permanent loss of Johnson's seagrass due to fragmentation of habitat.

The action area is not in or adjacent to designated critical habitat for Johnson's seagrass; therefore, none will be affected.

VI. Conclusion

After reviewing the current status of Johnson's seagrass, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is NMFS' biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of Johnson's seagrass or result in the destruction or adverse modification of critical habitat. Further surveys and monitoring of the action area after construction are necessary to quantify the effects of this project and to verify the conclusion of this Opinion.

VII. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

NMFS believes the following conservation recommendations are reasonable, necessary, and appropriate to minimize impacts of incidental loss of Johnson's seagrass. The NMFS strongly recommends that these measures be considered and adopted.

1. NMFS recommends that a report of all current and proposed COE projects in the range of Johnson's seagrass be prepared and used by the COE to assess impacts on the species from these projects, to assess cumulative impacts, and to assist in early consultation that will avoid and/or minimize impacts to Johnson's seagrass and its critical habitat. Information in this report should include location and scope of each project and identify the Federal lead agency for each project.

The information should be made available to the USCG, South Florida Water Management District, and NMFS.

2. NMFS recommends that the COE conduct and support research to assess trends in the distribution and abundance of Johnson's seagrass. Data collected should be contributed to the Florida Fish and Wildlife Conservation Commission's Florida Marine Research Institute to support ongoing GIS mapping of Johnson's and other seagrass distribution.
3. NMFS recommends that the COE, in coordination with seagrass researchers and industry, support ongoing research on light requirements and transplanting techniques to preserve and restore Johnson's seagrass, and on collection of plants for genetics research, tissue culture, and tissue banking.
4. NMFS recommends that the COE participate in state efforts to preserve and restore seagrass, and in the implementation of the Seagrass Preservation and Restoration Plan for the Indian River Lagoon.
5. NMFS recommends that the COE prepare an assessment of the effects of other actions under its purview on Johnson's seagrass for consideration in future consultations. NMFS recommends that the standardized survey methods identified at Attachment 1 (Recommendations for Sampling *Halophila johnsonii* at a Project Site) be used to collect data to support assessments of these new projects.

Reinitiation of Consultation

As provided in 50 CFR Section 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if (1) the amount or extent of taking specified in the proposed action is exceeded, (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the biological opinion, or (4) a new species is listed or critical habitat designated that may be affected by the identified action.

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ATTACHMENT 1

Recommendations for Sampling *Halophila johnsonii* at a Project Site

The above-suggested approaches for sampling *H. johnsonii* are recommendations of the *H. johnsonii* Recovery Team.

Objective:

To outline recommended survey methods for determining the distribution and abundance of *H. johnsonii* at sites under permit review. The methods should be applicable to a broad range of project scales, from a 20-m long dock, to marinas, bridges, and channels several kilometers long.

Problem:

Three aspects make quantitative sampling for *H. johnsonii* difficult: (1) Poor visibility; it is sometimes difficult to see more than 0.1 or even 0.01 m² at a time. (2) Patchy and clumped distribution, with patches as small as 0.01 m², which may be clumped together within a sub-area of the project area. (3) Stratified distribution, with occurrence perhaps limited to a particular depth gradient within a project area.

Recommended Methods:

The most appropriate approach depends on scale, and the amount of expected error depends on the approach. Unless a complete survey of the entire area is done, the estimated distribution and abundance of this species may be significantly in error. With the exception of very small project areas, efficient field sampling may require sampling in two stages. A preliminary visual reconnaissance of the site should be conducted to locate any occurrences of *H. johnsonii*. "The importance of preliminary sampling is probably the most under emphasized principal related to field studies. There is no substitute for it." (Green, 1979). Following the preliminary reconnaissance, a more comprehensive sampling, using one of the techniques outlined below, should be initiated.

In situ monitoring for *H. johnsonii* is absolutely necessary. Aerial photography may be used to map distributions of larger canopy-forming species; however, mapping of *H. johnsonii* cannot be done reliably from aerial photos. Because of significant seasonal and annual variation in distribution and abundance of *H. johnsonii*, surveys must be conducted during spring/summer (April 1-August 31) period of maximum abundance, and sampling in more than one summer is recommended. Length of time between survey date and actual start of project should consider the potentially rapid turnover and migration of *H. johnsonii*. Personnel conducting the survey should clearly demonstrate that they can distinguish between *H. johnsonii* and *H. decipiens*. Surveys labeled simply as "*Halophila*" are not sufficient.

Deliverables: 1) amount (acres or square meters) impacted, 2) estimate of percent coverage and the species present/absent, 3) site map with seagrass patch or bed locations, 4) size of the patches, and 5) shoot density estimate.

SMALL PROJECT SITES (<0.1 ha, e.g. 10 m by 100 m, such as single-family docks). Two methods.

1. Provide a site map of submerged lands adjacent to the action area. The site map should include transects approximately every 7.5 m apart, perpendicular to the shore, and for a length 6 m longer than the proposed activity. A preliminary visual reconnaissance is necessary to fill in the information between the transects. Seagrass patches should be identified by species composition and drawn on the site map. Density can be accomplished with random sub-sampling for density within the identified patches. (An overall site map is important since it identifies seagrass habitat, not just existing seagrass patches.) (Mezich 2000).

2. The site is sub-divided into m² grids. A complete and intensive mapping of the entire area of concern can be developed by using DGPS, with coordinates provided every m², or every patch >0.01-0.1 m², with a tested map accuracy of >50%-95%. If percent cover is not used, an illustrated, standardized scale of density should be used. Presence-absence should be determined for every m² grid cell.

For monitoring project effects, additional information on shoot density, blade length, and flowering, can be collected from a random sub-sample of grids using 25- by 25-cm quadrants or multiple 10- by 10-cm sub-cells within the m² grid.

INTERMEDIATE-AREA PROJECT SITES (0.1 to 1 ha, e.g., a 100-m by 100-m marina). A two-step process is required.

- a. Preliminary visual reconnaissance to locate general *H. johnsonii* areas and distribution.
- b. The site should then be surveyed using transects across the dominant spatial gradient (e.g., depth, inshore-offshore, channel-shoal, etc.) of the site. The number of transects and sample intervals should adequately describe distribution and abundance of *H. johnsonii* patches. Besides noting presence-absence, x-y-z diameters of encountered patches should be noted, together with sub-samples of shoot density, blade length, and presence of flowering.

LARGE-AREA PROJECT SITES (>1 ha). Three choices are possible after preliminary visual reconnaissance.

1. Random sampling of points or quadrats within the area.

Sampling at least 1%-30% of the total area.

- 2 stages: (1) visual reconnaissance, then stratify, (2) second intensive sampling, with intensity relative to abundance of *H. johnsonii* within the strata.
- single step of 100-1,000 points/quadrats (min. # = ?).

2. Intensive survey of transects.

Transects across the entire area, sampling at least 1%-30% of the total area.

- point-intersects sampling along transects (with the size of a "point" defined, e.g., 5 x 5 or 10 x 10 cm).
- belt transect, of 0.1-2 m width.
- transects randomly located (min. # transects = 10-50 or min. spacing = 50 m).
- regularly-spaced transects (min. # transects = 10-50 or min. spacing = 50 m).
- quadrants at regular intervals along line (min. # = 10-50 or min. spacing = 50 m).

For any of these transect methods, x-y-z diameters of any patches encountered should be measured. At a minimum, presence-absence should be recorded at each point of each quadrant.

3. Combinations of above methods, e.g.,

(a) Intensive mapping in area of primary impact (e.g., within footprint of proposed dock), plus random points in surrounding, potentially affected area.

(b) Stratify from random point sampling, then map intensively in areas of greatest abundance.

It is the position of the Recovery Team, however, that the adoption of a valid survey protocol for identifying Johnson's seagrass be required by permitting agencies in the range of the species. In all seagrass surveys, emphasis should be placed on the identification of seagrass habitat as well as the distribution of currently existing patches. Identifying impacts to seagrass habitat, particularly from large projects, is more important in the long run than the "point-in-time" management approach of avoiding currently existing patches.

References

- Green, R.H. 1979. Sampling design and statistical analysis methods environmental biologists. John. W. and Sons, Inc., New York.
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**STANDARD PROTECTION GUIDELINES (EXCERPTS)
FOR THREATENED AND ENDANGERED SPECIES
PALM BEACH HARBOR AND PEANUT ISLAND
CHANGE OF MAINTENANCE OPERATIONS AND OFFLOADING
PALM BEACH COUNTY, FLORIDA**

The Contractor shall instruct all personnel associated with the project of the potential presence of manatees, and sea turtles in the area, and the need to avoid collisions with and harming these animals. All construction personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, or sea turtles which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and the Florida Manatee Sanctuary Act. The Contractor shall be held responsible for any manatee or sea turtle harmed, harassed, or killed as a result of construction activities.

In the event that a threatened or endangered species is harmed as a result of construction activities, the Contractor shall cease all work and notify the Contracting Officer.

a. Siltation Barriers: If siltation barriers are used, they shall be made of material in which manatees cannot become entangled, are properly secured, and are regularly monitored to avoid manatee entrapment. Barriers must not block manatee entry to or exit from essential habitat.

b. Special Operating Conditions:

(1) All vessels associated with the project shall operate at "no wake/idle" speeds at all times while in waters where the draft of the vessel provides less than a four-foot clearance from the bottom, and vessels shall follow routes of deep water whenever possible. Boats used to transport personnel shall be shallow-draft vessels, preferably of the light-displacement category, where navigational safety permits. Mooring bumpers shall be placed on all barges, tugs, and similar large vessels wherever and whenever there is a potential for manatees to be crushed between two moored vessels. The bumpers shall provide a minimum stand-off distance of four feet.

(2) If a manatee(s) is sighted within 100 yards of the project area, all appropriate precautions shall be implemented by the Contractor to ensure protection of the manatee. These precautions shall include the operation of all moving equipment no closer than 50 feet of a manatee. If a manatee is closer than 50 feet to moving equipment or the project area, the equipment shall be shut down and all construction activities shall cease within the waterway to ensure protection of the manatee. Construction activities shall not resume until the manatee has departed the project area.

(3) Dredging operations shall cease if 3 turtles are taken until the Contracting Officer notifies the Contractor to resume dredging.

c. Manatee Monitoring (Clamshell Only): During clamshell dredging operations, a dedicated observer shall monitor for the presence of manatees. The dedicated observer shall have experience in manatee observation and be equipped with polarized sunglasses to aid in observing. If manatees are present, the observer shall document all activities with the use of a video camera with the capabilities of video taping at night. The videotape shall have date/time signature and record all manatee movements in the construction area and note any reactions to turbidity, sound, and light. Nighttime lighting of waters within and adjacent to the work area shall be illuminated, using shielded or low-pressure sodium-type lights, to a degree that allows the dedicated observer to sight any manatee on the surface within 200 feet of the operation. The dredge operator shall gravity-release the clamshell bucket only at the water surface, and only after confirmation that there are no manatees within the safety distance identified in the standard construction conditions. The Contractor shall forward 3 copies to Dr. Loren Mason, Chief,

Environmental Branch, P.O. Box 4970, Jacksonville, Florida, 32232-0019, within 10 days of completion of the dredging.

d. **Manatee Signs:** Prior to commencement of construction, each vessel involved in construction activities shall display at the vessel control station or in a prominent location, visible to all employees operating the vessel, a temporary sign at least 8-1/2" x 11" reading, "CAUTION: MANATEE HABITAT/IDLE SPEED IS REQUIRED IN CONSTRUCTION AREA." In the absence of a vessel, a temporary 3' x 4' sign reading "CAUTION: MANATEE AREA" shall be posted adjacent to the issued construction permit. A second temporary sign measuring 8-1/2" x 11" reading "CAUTION: MANATEE HABITAT. EQUIPMENT MUST BE SHUTDOWN IMMEDIATELY IF A MANATEE COMES WITHIN 50 FEET OF OPERATION" shall be posted at the dredge operator control station and at a location prominently adjacent to the issued construction permit. The Contractor shall remove the signs upon completion of construction. Sample Manatee Caution Signs are appended to the end of this Section.

Endangered Species Observers (Hopper Dredge Only)

During dredging operations, an observer approved by the National Marine Fisheries Service (NMFS) for sea turtles and whales shall be aboard to monitor for the presence of the species. During transit to and from the disposal area, the observer shall monitor from the bridge during daylight hours for the presence of endangered species, especially the right whale, during the period December through March. During dredging operations, the observer shall monitor the inflow screening for turtles and/or turtle parts.

a. **Observation Sheets:** The results of the monitoring shall be recorded on the appropriate observation sheet. An observation sheet shall be completed for each dredging cycle whether or not sea turtle or sea turtle parts are present. Sample observation sheets are appended to the end of this Section.

b. **Endangered Species Observer(s):** NMFS-approved firms shall provide and manage the endangered species observer(s). A list of acceptable firms can be obtained by contacting NMFS Chief of Office of Protective Species in St. Petersburg, Florida at 727-570-5312. The trained observer(s) shall require quarters on board the dredge.

Manatee and Sea Turtle Sighting Reports

Any take concerning a manatee, sea turtle, or whale or sighting of any injured or incapacitated manatees, sea turtles, or whales shall be reported immediately to the Corps of Engineers. The order of contact within the Corps of Engineers shall be as follows:

Order of Contact of Corps Personnel for Dredging Contractor to Report Endangered Species Death or Injury

<u>Title</u>	<u>Telephone Number</u>	<u>Work Hours</u>	<u>After Hours</u>
Corps, Inspector	On site		Lodging Location
Mr. [], [Area][Resident][Antilles] Engineer, []			
(CESAJ-[]-[])		[]	To be Provided
Dr. Loren Mason, Chief, Environmental Branch, Planning			
Division (CESAJ-PD-E)	904-232-1010		To be Provided
Mr. Charles McGehee, Chief, Construction			
Branch, Construction-Operations			
Division (CESAJ-CO-C)	904-232-1122		To be Provided
Mr. Gordon M. Butler, Jr., Chief,			
Construction-Operations Division			
(CESAJ-CO)	904-232-3765		To be Provided

3.1.5.6 Hopper Dredge Equipment

Hopper dredge drag heads shall be equipped with rigid sea turtle deflectors which are rigidly attached. No dredging shall be performed by a hopper dredge without a turtle deflector device that has been approved by the Contracting Officer. (Sample Turtle Deflector Design Details are appended to the end of this Section.)

a. Deflector Design:

(1) The leading vee-shaped portion of the deflector shall have an included angle of less than 90 degrees. Internal reinforcement shall be installed in the deflector to prevent structural failure of the device. The leading edge of the deflector shall be designed to have a plowing effect of at least 6" depth when the drag head is being operated. Appropriate instrumentation or indicator shall be used and kept in proper calibration to insure the critical "approach angle". (Information Only Note: The design "approach angle" or the angle of lower drag head pipe relative to the average sediment plane is very important to the proper operation of a deflector. If the lower drag head pipe angle in actual dredging conditions varies tremendously from the design angle of approach used in the development of the deflector, the 6" plowing effect does not occur. Therefore, every effort should be made to insure this design "approach angle" is maintained with the lower drag pipe.)

(2) If adjustable depth deflectors are installed, they shall be rigidly attached to the drag head using either a hinged aft attachment point or an aft trunnion attachment point in association with an adjustable pin front attachment point or cable front attachment point with a stop set to obtain the 6" plowing effect. This arrangement allows fine-tuning the 6" plowing effect for varying depths. After the deflector is properly adjusted there shall be NO openings between the deflector and the drag head that are more than 4" by 4".

b. In Flow Basket Design:

(1) The Contractor shall install baskets or screening over the hopper inflow(s) with no greater than 4" x 4" openings. The method selected shall depend on the construction of the dredge used and shall be approved by the Contracting Officer prior to commencement of dredging. The screening shall provide 100% screening of the hopper inflow(s). The screens and/or baskets shall remain in place throughout the performance of the work.

(2) The Contractor shall install and maintain floodlights suitable for illumination of the baskets or screening to allow the observer to safely monitor the hopper basket(s) during non-daylight hours or other periods of poor visibility. Safe access shall be provided to the inflow baskets or screens to allow the observer to inspect for turtles, turtle parts or damage.

c. Hopper Dredge Operation:

(1) The Contractor shall operate the hopper dredge to minimize the possibility of taking sea turtles and to comply with the requirements stated in the Incidental Take Statement provided by the National Marine Fisheries Service in their Biological Opinion.

(2) The turtle deflector device and inflow screens shall be maintained in operational condition for the entire dredging operation.

(3) When initiating dredging, suction through the drag heads shall be allowed just long enough to prime the pumps, then the drag heads must be placed firmly on the bottom. When lifting the drag heads from the bottom, suction through the drag heads shall be allowed just long enough to clear the lines, and then must cease. Pumping water through the drag heads shall cease while maneuvering or during travel to/from the disposal area. (Information Only Note: Optimal suction pipe densities and velocities occur when the deflector is operated properly. If the required dredging section includes compacted fine

sands or stiff clays, a properly configured arrangement of teeth may enhance dredge efficiency which reduces total dredging hours and "turtle takes." The operation of a drag head with teeth must be monitored for each dredged section to insure that excessive material is not forced into the suction line. When excess high-density material enters the suction line, suction velocities drop to extremely low levels causing conditions for plugging of the suction pipe. Dredge operators should configure and operate their equipment to eliminate all low-level suction velocities. Pipe plugging in the past was easily corrected, when low suction velocities occurred, by raising the drag head off the bottom until the suction velocities increased to an appropriate level. Pipe plugging cannot be corrected by raising the drag head off the bottom. Arrangements of teeth and/or the reconfiguration of teeth should be made during the dredging process to optimize the suction velocities.)

(4) Raising the drag head off the bottom to increase suction velocities is not acceptable. The primary adjustment for providing additional mixing water to the suction line should be through water ports. To insure that suction velocities do not drop below appropriate levels, the Contractor's personnel shall monitor production meters throughout the job and adjust primarily the number and opening sizes of water ports. Water port openings on top of the drag head or on raised stand pipes above the drag head shall be screened before they are utilized on the dredging project. If a dredge section includes sandy shoals on one end of a tract line and mud sediments on the other end of the tract line, the Contractor shall adjust the equipment to eliminate drag head pick-ups to clear the suction line.

(5) Near the completion of each payment section, the Contractor shall perform sufficient surveys to accurately depict those portions of the acceptance section requiring cleanup. The Contractor shall keep the drag head buried a minimum of 6 inches in the sediment at all times. Although the over depth prism is not the required dredging prism, the Contractor shall achieve the required prism by removing the material from the allowable over depth prism.

(6) During turning operations the pumps must either be shut off or reduced in speed to the point where no suction velocity or vacuum exists.

(7) These operational procedures are intended to stress the importance of balancing the suction pipe densities and velocities in order to keep from taking sea turtles. The Contractor shall develop a written operational plan to minimize turtle takes and submit it as part of the Environmental Protection Plan.

(8) The Contractor must comply with all requirements of this specification and the Contractor's accepted Environmental Protection Plan. The contents of this specification and the Contractor's Environmental Protection Plan shall be shared with all applicable crew members of the hopper dredge.

3.1.5.7 Recording Charts for Hopper Dredge(s)

All hopper dredge(s) shall be equipped with recording devices for each drag head that capture real time, drag head elevation, slurry density, and at least two of the following: Pump(s) slurry velocity measured at the output side, pump(s) vacuum, and/or pump(s) RPM. The Contractor shall record continuous real time positioning of the dredge, by plot or electronic means, during the entire dredging cycle including dredging area and disposal area. Dredge location accuracy shall meet the requirements of the latest version of COE EM 1110-1-1003. A copy of the EM can be downloaded from the following web site: <http://www.usace.army.mil/inet/usace-docs/eng-manuals/em.htm>. The recording system shall be capable of capturing data at variable intervals but with a frequency of not less than every 60 seconds. All data shall be time correlated to a 24 hour clock and the recording system shall include a method of daily evaluation of the data collected. Data shall be furnished to the Contracting Officer for each day's operation on a daily basis. A written plan of the method the Contractor intends to use in order to satisfy these requirements shall be included with the Contractor's Quality Control Plan.

3.1.5.8 Sea Turtle Risk Assessment (For Hopper Dredges Only)

a. **Sea Turtle Trawling and Relocation:** A sea turtle risk assessment survey shall be conducted following the take of three sea turtles and continue until directed by the Contracting Officer. The results of each trawl shall be recorded on Sea Turtle Trawling Report appended to the end of this Section. A final report shall be prepared and submitted to the Contracting Officer prior to re-commencement of dredging summarizing the results of the survey (with all forms and including total trawling times, number of trawls and number of captures). Any turtles captured during the survey shall be measured and tagged in accordance with standard biological sampling procedures with sampling data recorded on Sea Turtle Tagging and Relocation Report appended to the end of this Section. Any captured sea turtles shall be relocated south of the work area at least 3 miles from the location recorded on the Sea Turtle Tagging and Relocation Report form.

b. **Sea Turtle Trawling Procedures:** An approved sea turtle trawling and relocation supervisor shall provide researchers and nets to capture and relocate sea turtles, shall conduct Sea Turtle Risk Assessment Survey, and shall conduct any initiated sea turtle trawling. Turtles shall be captured with trawl nets to determine their relative abundance in the channel during dredging. Methods and equipment shall be standardized including data sheets, nets, trawling direction to tide, length of station, length of tow, and number of tows per station. Data on each tow shall be recorded using Sea Turtle Trawling Report appended to end of this Section. The trawler shall be equipped with two 60-foot nets constructed from 8-inch mesh (stretch) fitted with mud rollers and flats as specified in Turtle Trawl Nets Specifications appended to the end of this Section. Paired net tows shall be made for 10 to 12 hours per day or night. Trawling shall be conducted with the tidal flow using repetitive 15-30 minute (total time) tows in the channel. Tows shall be made in the center, green and red sides of the channel such that the total width of the channel bottom is sampled. Positions at the beginning and end of each tow shall be determined from GPS Positioning equipment. Tow speed shall be recorded at the approximate midpoint of each tow. Refer to COE EM 1110-1-1003, paragraph 5.3 and Table 5-1, for acceptable GPS criteria.

c. **Water Quality and Physical Measurements:** Water temperature measurements shall be taken at the water surface each day using a laboratory thermometer. Weather conditions shall be recorded from visual observations and instruments on the trawler. Weather conditions, air temperature, wind velocity and direction, sea state-wave height, and precipitation shall be recorded on the Sea Turtle Trawling Report appended to the end of this Section. High and low tides shall be recorded.

d. **Initiation of Trawling:** Initiate trawling if three turtles are taken. The Contractor must initiate trawling and relocation activity in the dredging area within 8 hours of the occurrence of the take. Trawling shall continue until suspended by the Contracting Officer.

e. **Approved Trawling Supervisor:** Trawling shall be conducted under the supervision of a biologist approved by the NMFS. A letter of approval from NMFS shall be provided to the Contracting Officer prior to commencement of trawling.

f. **Turtle Excluder Devices:** Approval for trawling for sea turtles without Turtle Excluder Devices (TEDs) must be obtained from NMFS. Approval for capture and relocation of sea turtles must be obtained from the [Florida Fish and Wildlife Conservation Commission (FF&WCC)] [Puerto Rico Department of Natural Environmental Resources (PRDNER)]. Approvals must be submitted to the Contracting Officer prior to trawling.

g. **Report Submission:** Following completion of the project, a copy of the Contractor's log regarding sea turtles shall be forwarded to the Dr. Loren Mason, Chief, Environmental Branch and the [Area] [Resident] [Antilles] Engineer, [] [Area] [Resident] [Antilles] Office within 10 working days.

Sea Turtle Beach Nest Monitoring

a. **Sea Turtle (Work Stoppage) Window and Monitoring:** If dredging and placement of material in the beach fill area along Florida Beaches has commenced on or before March 1st, turtle monitoring and nest location shall commence on March 1st and continue concurrently with the performance of work. If dredging and placement of material on Florida Beaches has not commenced prior to March 1st, the Contractor shall commence turtle monitoring and nest location activities for a period of 65 days prior to performing any work (including movement of equipment) in the beach fill area or commence turtle monitoring March 1st whichever date is later. In such case, after turtle monitoring and nest location activities have been performed for a period of 65 days, the Contractor shall commence work in the beach fill area and continue the monitoring activities concurrently with performance of the work. In any case turtle monitoring and nest location/relocation activities are required through November 30th or until completion of the work on Florida Beaches, whichever is earlier.

b. **Daily Visual Inspection:** Turtle monitoring activities shall include performance of daily visual inspections of the beach at sunrise by a person permitted by the FF&WCC for handling sea turtle eggs. Any nests discovered shall be excavated and relocated prior to 9:00 a.m. to a nearby self-release beach location where artificial lighting and/or other disturbances shall not interfere with successful incubation, hatching nor hatchling orientation. A log of the results of turtle egg monitoring and recovery activities shall be kept and a copy submitted weekly to the Dr. Loren Mason, Chief, Environmental Branch, Jacksonville District (sample Marine Turtle Nesting Summary Report form is appended to the end of this Section).

c. **Turtle Subcontractor:** The Contractor shall have a [FF&WCC] [PRDNER] permitted subcontractor approved by the Contracting Officer to accomplish the sea turtle monitoring of this section unless he demonstrates to the satisfaction of the Contracting Officer the capability to accomplish sea turtle monitoring and recovery by obtaining a permit from the [FF&WCC] [PRDNER] to take turtles.

d. **Report Submission:** Following completion of the project, a copy of the Contractor's log regarding sea turtles shall be forwarded to the Chief, Environmental Branch and the [Area] [Resident] [Antilles] Engineer, [] [Area] [Resident] [Antilles] Office.

Beach Placement Restrictions

a. **Equipment Lighting During Sea Turtle Nesting Period May 1st to November 30th:** Direct lighting of the beach and near shore waters shall be limited to the immediate construction area and shall comply with safety requirements. Lighting on offshore or onshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the waters surface and nesting beach while meeting all Coast Guard, COE EM 385-1-1, and OSHA requirements. Light intensity of lighting plants should be reduced to the minimum standard required by OSHA for General Construction areas, in order not to misdirect sea turtles. Shields should be affixed to the light housing and be large enough to block light from all lamps from being transmitted outside the construction area. Refer to Beach Lighting Schematic appended to the end of this Section.

b. **Pipeline Placement:** Any construction pipes placed parallel to the shoreline shall be placed as far landward as possible up to the vegetated dune line.

c. **Beach Tilling:** Till the fill area between the landward edge and the seaward edge of the top of the berm with equipment operated so as to penetrate and loosen beach sand (a) to a depth of 36 inches and (b) laterally without leaving unloosened compact sand between the adjacent paths of tines or penetrating part of the equipment. (Suitable equipment is Caterpillar D9L/No. 9 Adjustable Parallelogram Multishank Ripper, or equal.) The Contractor shall be careful not to drag the beach where rock structures have been covered with less than 3 feet of sand.

APPENDIX D – ENGINEERING INFORMATION

**Letter Report
Peanut Island Disposal Area
Cost Sharing of Dike Construction
Palm Beach, Florida**

1. Project Description: The port of Palm Beach is the feeder port for South Florida and the interisland trade. Based on tonnage, Palm Beach is 6th largest port in Florida, handling approximately 2.3 million tons of cargo annually as well as tourist traffic. Approximately 26% of these quantities are fossil fuels (bulk petroleum products and coal). The existing channel is 35 to 33 feet deep and varies in width from 400 to 300 feet. Vessels currently using the harbor are constrained by this 33-foot depth. Peanut Island is an upland disposal site located at the mouth of Lake Worth inlet.

2. Issue: Currently, the Peanut Island disposal area has 180,000 cubic yards (CY) of capacity. Additional dike height/maintenance is required. The Florida Inland Navigation District (FIND), the Port of Palm Beach (Local Sponsor), and the U.S. Army Corps of Engineers (Corps) have acknowledged the need for creating new disposal capacity in a Preliminary Assessment (PA) dated 1997. These disposal sites on Peanut Island are required due to the quantity of material removed from Palm Beach Harbor and the IWW in the vicinity of Palm Beach. The Corps, FIND, and the Port of Palm Beach eventually plan to enter into a long term plan to cover all dike construction requirements and material removal necessary for disposal capacity to meet the 20 year requirement stipulated by the PA. Offloading dredged material from the island to an elevation of 4 feet above MLW, combined with the construction of 3200 linear feet of new dike on Peanut Island to an elevation of 32 feet above MLW is proposed to increase storage capacity by 730,000 CY.

3. Dredging Requirements: Historical records indicate maintenance dredging has occurred almost annually in Palm Beach Harbor since 1938. Shoals removal from 1995 to 2000 totaled 730,000 CY. The average annual shoaling rate is approximately 122,000 CY per year for the Palm Beach Harbor Navigation Project. Programmed disposal consistent with the 10-year Operations and Maintenance (O&M) program is 25,000 CY per year for Peanut Island. The material is predominantly beach quality and the majority would be deposited on the beaches south of the Lake Worth inlet. If Peanut Island is filled to capacity and the beach site is closed (turtle nesting, lack of capacity, etc.), then the beach and non-beach quality material have no designated disposal location.

Programmed Maintenance Dredging cost from 1996 to 2005 has been projected to be \$1,892,882 annually.

4. Economics: Palm Beach Harbor continues to be a viable port as shown in the following table of annual tonnage with an average annual 1 percent increase. Future projections indicate that this trend will continue. Failure to maintain Palm Beach Harbor would negatively impact the national economy based on increased transportation costs. Peanut Island plays a part in the ability to construct and maintain the harbor, with all construction dredge material designated for Peanut Island.

Table of Yearly Tonnage

YEAR	TOTAL TONS
1988	2,579
1989	2,519
1999	2,466
1991	2,075
1992	2,646
1993	2,816
1994	2,884
1995	2,972
1996	2,294
1997	2,922

5. Benefits/Costs: Contract Administration costs and allowances for contingencies, bring the total project costs to \$6,892,920. The Federal share (65%) would be \$4,480,398. Minimal annual maintenance of the disposal area is expected.

If the current beach placement area becomes unavailable and the proposed dike construction and material unloading is not performed at Peanut Island, the dredged material would have to go to an alternate site. Therefore, material typically intended for the beach sites would be deposited in an ODMDS. An ODMDS does not currently exist and availability is not anticipated. Furthermore, suitable upland areas (outside of Peanut Island) within 5 miles of Palm Beach Harbor simply are not available. Based on the current estimates for Palm Beach Harbor dredge material area management, unloading Peanut Island's material dry (without rock separation) onto barges with subsequent dumping into a 2 million CY borrow area at the bottom of Lake Worth adjacent to the City of Lake Worth Municipal Golf Course is the least cost offload alternative. This offload would not be atypical for this site. Approximately 5,000 CY of material was used for fill behind seawall adjacent to berth 7 in 1998.

Should a disposal area be constructed in order to comply with the DMMP's requirements for the Port of Palm Beach, the following least cost maintenance regime may be employed. A hopper dredge could be used during the winter in order to comply with the state's summer environmental windows. This proposed alternative would place a cheaper hydraulic dredge in the inlet during the summer (with higher productivity due to smaller wave climate). The dredged material would then be deposited on Peanut Island for 6 years and in the 6th year it would be unloaded at a convenient time. Considering the estimated 122,000 CY annually deposited into the Peanut Island disposal area, this maintenance regime would have maintenance costs of \$2,027,876 annually. Proposed unloading, dike construction and unloading at Peanut Island will

cost the government an estimated \$1,261,439 Average Annual Equivalent (AAEQ) for a fifty-year project life. Including the initial creation of the disposal site necessitated by the absence of a non-beach disposal option, material directed to Peanut Island by summer pipeline versus winter hopper disposing to nearshore would result in savings of \$766,437 AAEQ.

6. Environmental/Permits: An environmental assessment has been completed and has been coordinated as per the Fish and Wildlife Coordination Act of 1958, and , as amended. All construction shall take place within the footprint of the existing disposal area. No additional permits are required.

APPENDIX E – OTHER ACTIONS ON PEANUT ISLAND

DEPARTMENT OF THE ARMY PERMIT

Permittee: Palm Beach County

Permit No. 199603357(IP-RM) DUPLICATE

Issuing Office: U.S. Army Engineer District, Jacksonville

NOTE: The term "you" and its derivatives, as used in this permit, means permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: To excavate approximately 1,000 cubic yards from 0. acres of tidal waters, construct a 130-foot bulkhead, a fishing pier 136-foot by 8-foot with a "T" shape platform 16-foot by 66-foot, a 20 slip dc 231-foot by 8-foot with a "T" shape platform 8-foot by 66-foot, 8 finger piers 5.5-foot by 16-foot and 10 mooring pilings as shown and described c the attached plans numbered 199603357(IP-RM) in 9 sheets, dated July 1, 1996.

Geographic Position: Latitude 26°46'03" North
Longitude 80°02'05" West

Project Location: The project is located on Peanut Island, Section 34, Township 42 South, Range 43 East, Palm Beach County, Florida. The projec is located in Lake Worth, adjacent to the Lake Worth Inlet.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on **SEP 16 2001**. If you find that you need more time to complete the authorized activity,

submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature and mailing address of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. The permittee shall place manatee information signs on the 20 slip marina.

2. The permittee shall place 2 manatee awareness signs in close proximity to the boat dock facility.

3. The permittee shall abide by the manatee construction conditions.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

(x) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)

(x) Section 404 of the Clean Water Act (33 U.S.C. 1344).

() Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal projects.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.1 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree comply with the terms and conditions of this permit.

Paul K. Smith
(PERMITTEE)

Sept 16, 1996
(DATE)

This permit becomes effective when the Federal official, designated to a for the Secretary of the Army, has signed below.

Terry L. Rice
(DISTRICT ENGINEER)
TERRY L. RICE
Colonel, U.S. Army

17 September 1996
(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

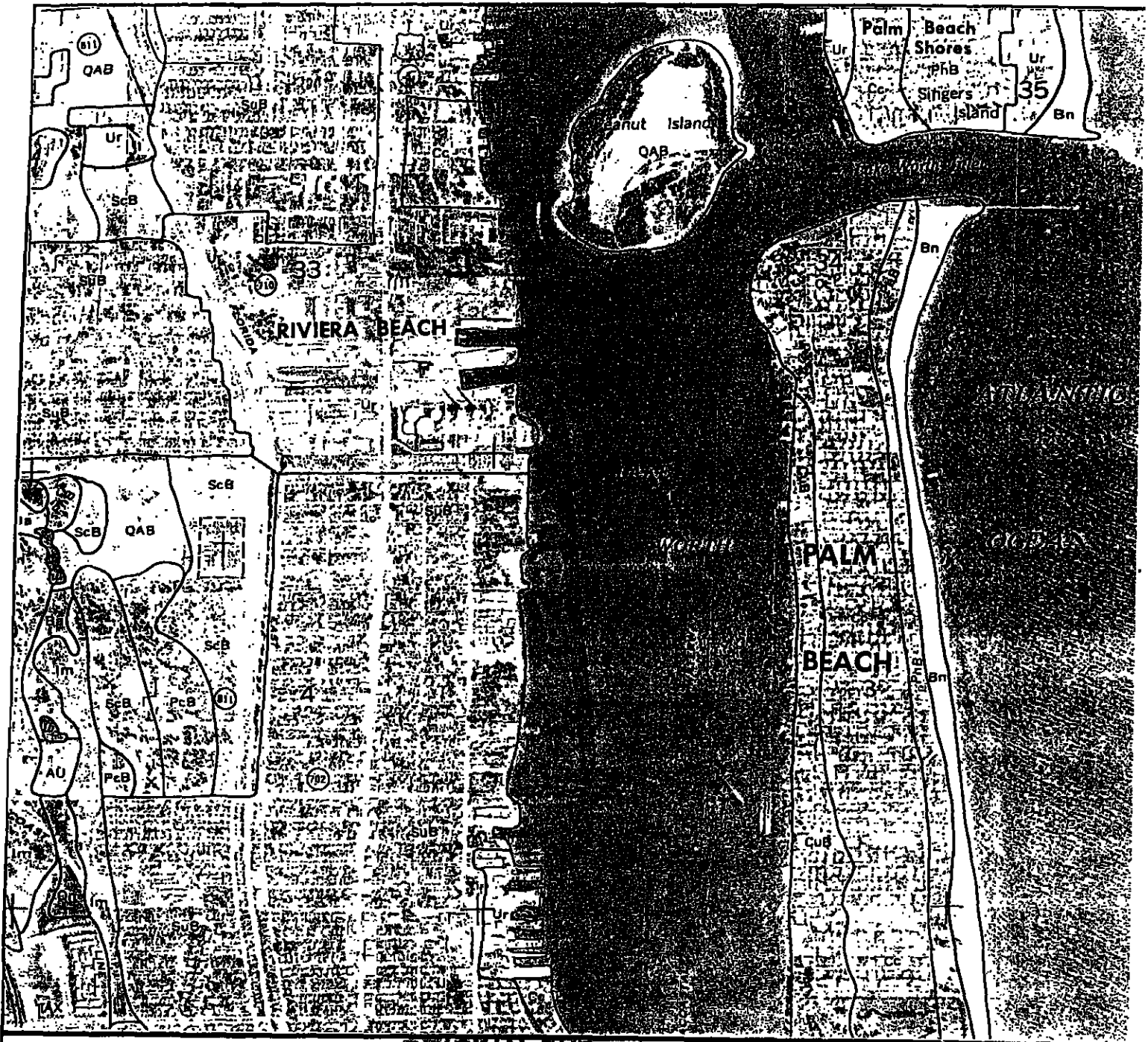
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(DATE)

(NAME-PRINTED)

(ADDRESS)

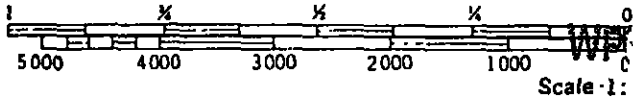
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Source: USDA SCS Palm Beach County **ORIGINAL SUBMITTAL**

MAY 20 1996

Johnson
5/16/96

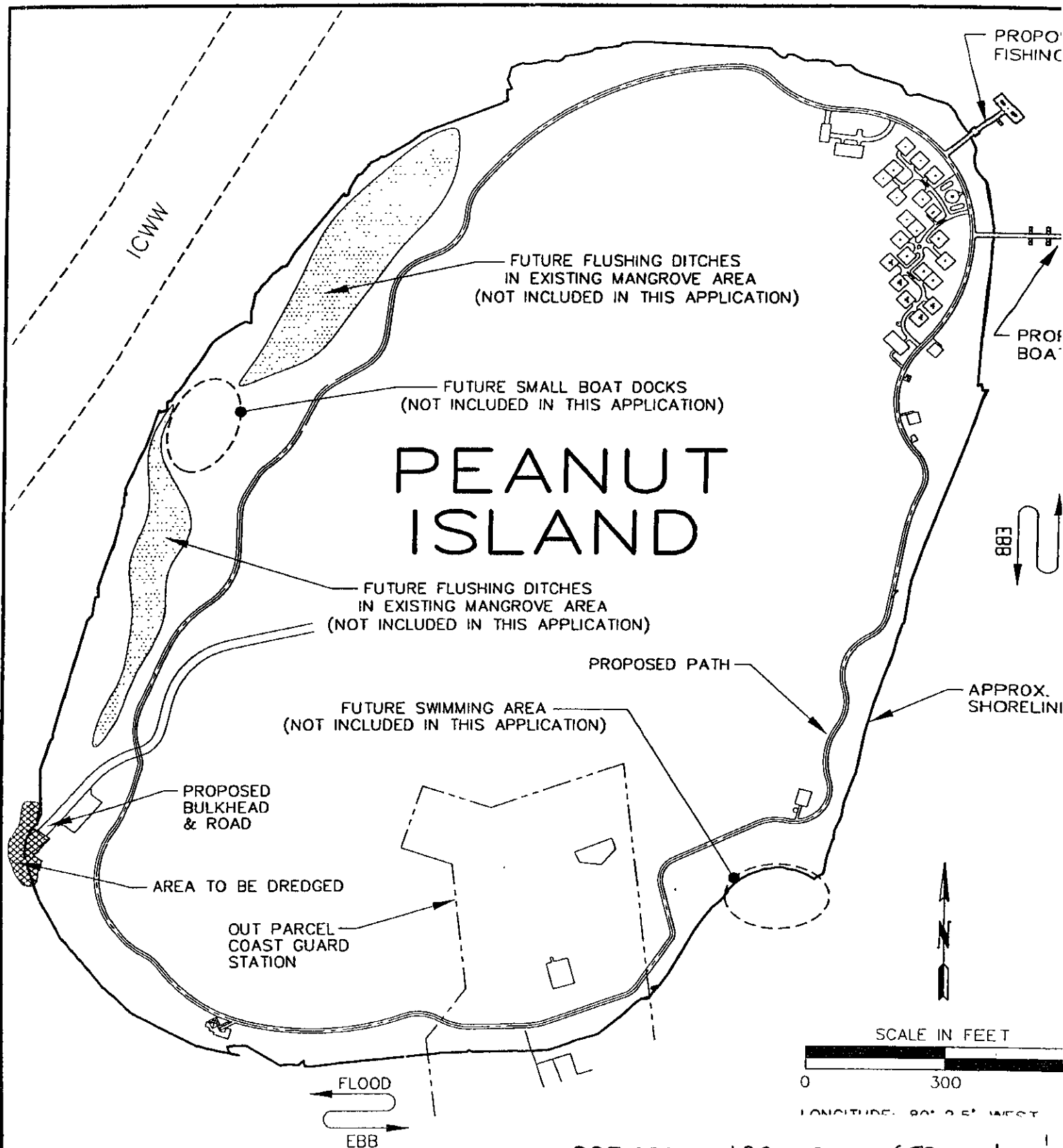


DESC. JSY
DRAW GOO
CHKD *[Signature]*
APRV *[Signature]*

PEANUT ISLAND
PALM BEACH COUNTY

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COE APPL # 199603357 (IP-RM)
DEP / SFWMD # 960520-18
DATE 7/1/96
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COE APPL # 199603357 (IP-Rm)

DEP / SFWMD # 960520-18

DATE 7/1/96

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GEE & JENSON

DESIG. JSY

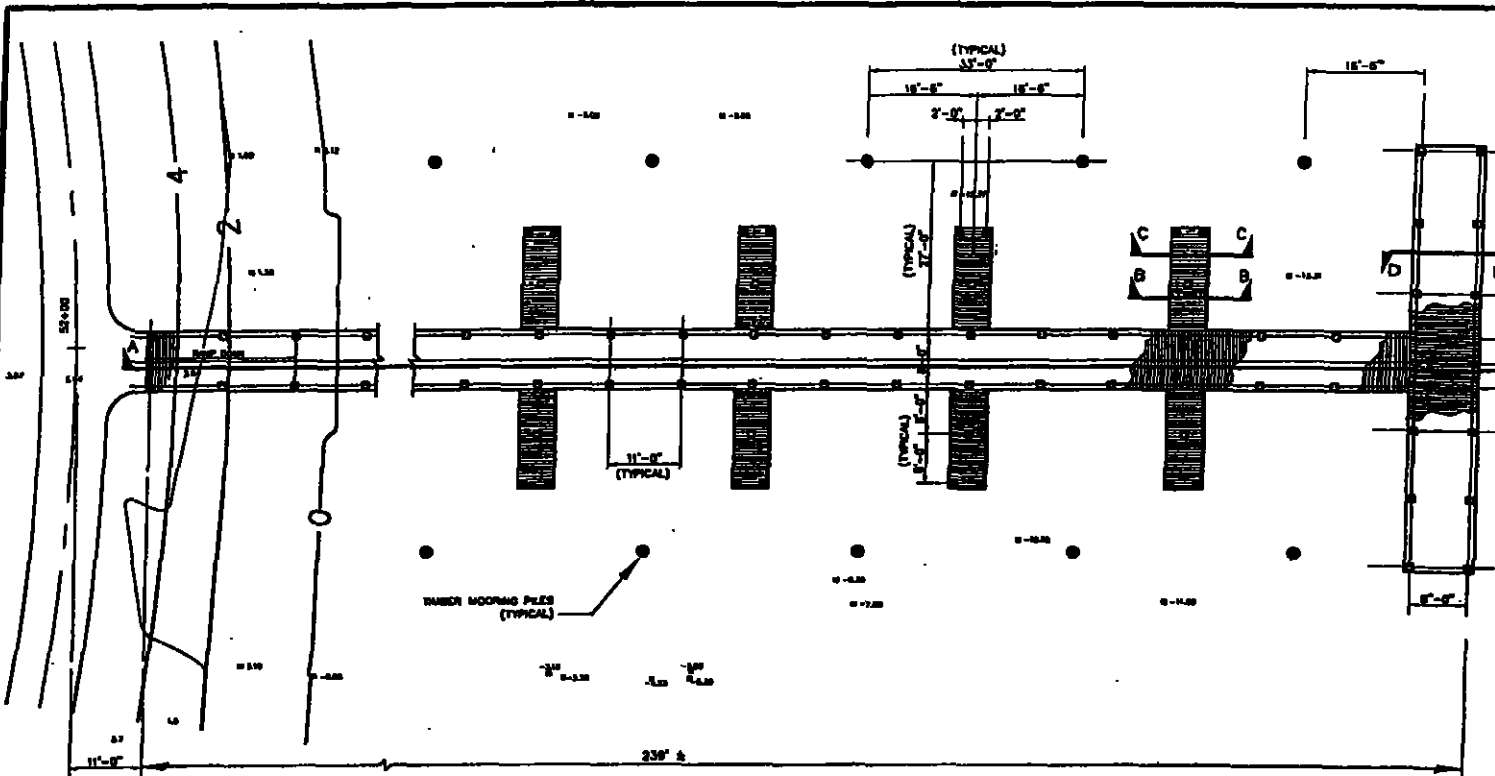
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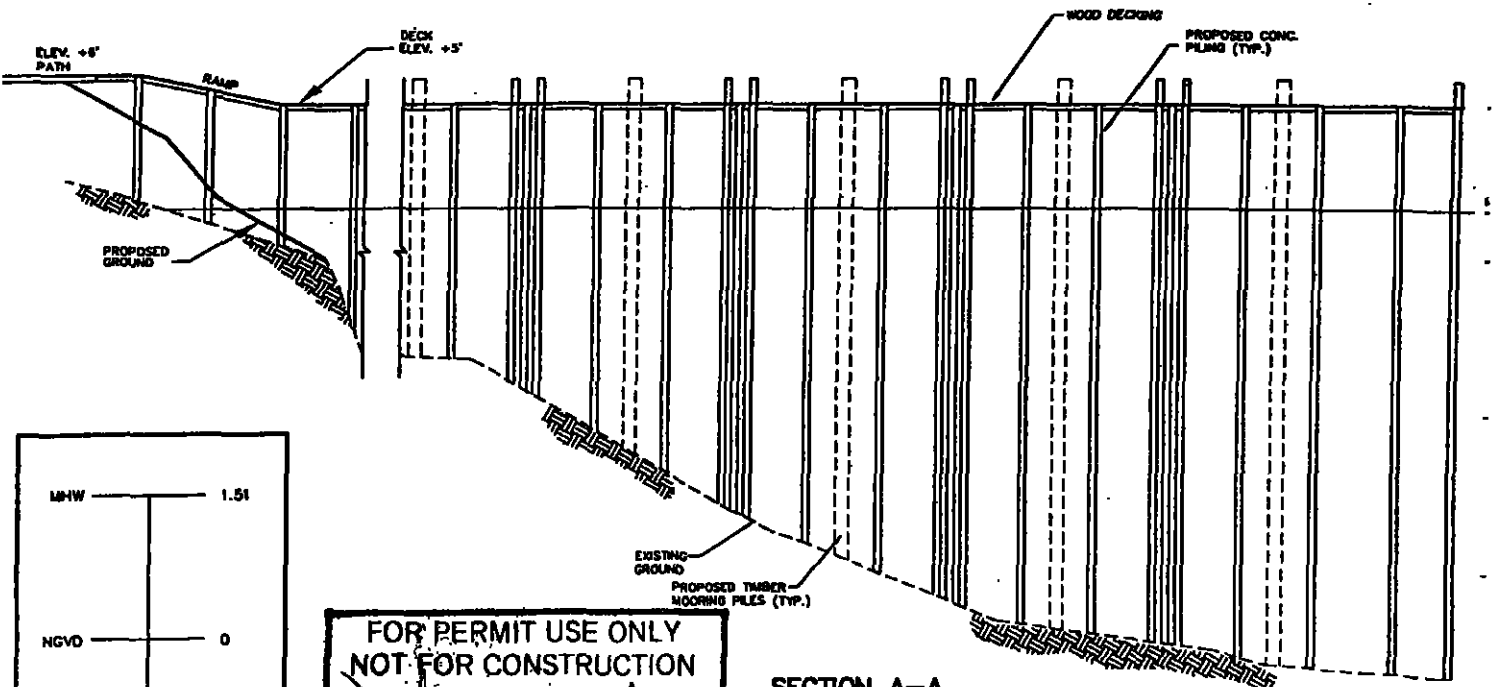
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APPLICANT: PA

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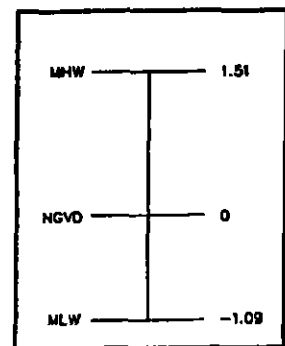


BOAT DOCK PLAN



SECTION A-A

SCALE IN FEET



ELEVATIONS REFERENCED TO NGVD

FOR PERMIT USE ONLY
NOT FOR CONSTRUCTION
JOHN S. YEEND, P.E.
DATE 5/16/96

	DESIG. JSY
	DRAW GOO
	CHKD <i>[Signature]</i>
	APRV <i>[Signature]</i>

PEANI
PALM BEA 159

COE APPL # 199603557 (IP-RM)
DEP / SFWMD # 960520-18
DATE 7/1/96
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SPECIAL CONDITIONS

1. MINIMUM BUILDING FLOOR ELEVATION: 9 FEET NGVD.
2. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION, SHOALING OR WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.
3. MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.
4. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT ADDITIONAL WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.
5. FACILITIES OTHER THAN THOSE STATED HEREIN SHALL NOT BE CONSTRUCTED WITHOUT AN APPROVED MODIFICATION OF THIS PERMIT.
6. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF THE PERMITTEE. PRIOR TO TRANSFER OF TITLE FOR ANY PORTION OF THE PROJECT TO A THIRD PARTY, MODIFICATION OF THE PERMIT WILL BE REQUIRED.
7. SILT SCREENS, HAY BALES OR OTHER SUCH SEDIMENT CONTROL MEASURES SHALL BE UTILIZED DURING CONSTRUCTION. THE SELECTED SEDIMENT CONTROL MEASURES SHALL BE INSTALLED LANDWARD OF THE UPLAND BUFFER ZONES AROUND ALL PROTECTED WETLANDS. ALL AREAS SHALL BE STABILIZED AND VEGETATED IMMEDIATELY AFTER CONSTRUCTION TO PREVENT EROSION INTO THE WETLANDS AND UPLAND BUFFER ZONES.
8. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE PERIMETER OF THE PROTECTED WETLANDS AND BUFFER ZONES SHALL BE FENCED TO PREVENT ENCROACHMENT INTO THE WETLANDS. THE PERMITTEE SHALL NOTIFY THE SFWMD'S ENVIRONMENTAL COMPLIANCE STAFF IN WRITING UPON COMPLETION OF FENCING AND SCHEDULE AN INSPECTION OF THIS WORK. THE PERMITTEE SHALL MODIFY THE FENCING IF SFWMD STAFF DETERMINES IT IS INSUFFICIENT OR IS NOT IN CONFORMANCE WITH THE INTENT OF THIS PERMIT. FENCING SHALL REMAIN IN PLACE UNTIL ALL ADJACENT CONSTRUCTION ACTIVITIES ARE COMPLETE.
9. THE SFWMD RESERVES THE RIGHT TO REQUIRE REMEDIAL MEASURES TO BE TAKEN BY THE PERMITTEE IF WETLAND AND/OR UPLAND MONITORING OR OTHER INFORMATION DEMONSTRATES THAT ADVERSE IMPACTS TO PROTECTED, CONSERVED, INCORPORATED OR MITIGATED WETLANDS OR UPLANDS HAVE OCCURRED DUE TO PROJECT RELATED ACTIVITIES.
10. ANY FUTURE CHANGES IN LAND USE OR TREATMENT OF WETLANDS AND/OR UPLAND BUFFER/COMPENSATION AREAS MAY REQUIRE A SURFACE WATER MANAGEMENT PERMIT MODIFICATION AND ADDITIONAL ENVIRONMENTAL REVIEW BY DISTRICT STAFF. PRIOR TO THE PERMITTEE INSTITUTING ANY FUTURE CHANGES NOT AUTHORIZED BY THIS

PERMIT, THE PERMITTEE SHALL NOTIFY THE SFWMD OF SUCH INTENTIONS FOR A DETERMINATION OF ANY NECESSARY PERMIT MODIFICATIONS.

11. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE SUCCESSFUL COMPLETION OF THE MITIGATION WORK, INCLUDING THE MONITORING AND MAINTENANCE OF THE MITIGATION AREAS FOR THE DURATION OF THE PLAN. THE MITIGATION AREA(S) SHALL NOT BE TURNED OVER TO THE OPERATION ENTITY UNTIL THE MITIGATION WORK IS ACCOMPLISHED AS PERMITTED AND SFWMD STAFF HAS CONCURRED.
12. ACTIVITIES ASSOCIATED WITH IMPLEMENTATION OF THE WETLAND MITIGATION, MONITORING AND MAINTENANCE SHALL BE IN ACCORDANCE WITH THE FOLLOWING WORK SCHEDULE. ANY DEVIATION FROM THESE TIME FRAMES SHALL REQUIRE FORMAL SFWMD APPROVAL. SUCH REQUESTS MUST BE MADE IN WRITING AND SHALL INCLUDE (1) REASON FOR THE MODIFICATION; (2) PROPOSED START/FINISH DATES; AND (3) PROGRESS REPORT ON THE STATUS OF THE EXISTING MITIGATION EFFORTS.

COMPLETION DATE	ACTIVITY
APRIL 1, 1997	TIME ZERO SEAGRASS SURVEY
MAY 1, 1997	TIME ZERO MONITORING REPORT
SEPTEMBER 1, 1998	FIRST MONITORING REPORT
SEPTEMBER 1, 1999	SECOND MONITORING REPORT
SEPTEMBER 1, 2000	THIRD MONITORING REPORT
SEPTEMBER 1, 2001	FOURTH MONITORING REPORT
SEPTEMBER 1, 2002	FIFTH MONITORING REPORT

13. ENDANGERED SPECIES, THREATENED SPECIES, OR SPECIES OF SPECIAL CONCERN HAVE BEEN OBSERVED ONSITE AND/OR THE PROJECT CONTAINS SUITABLE HABITAT FOR THESE SPECIES. IT SHALL BE THE PERMITTEE'S RESPONSIBILITY TO COORDINATE WITH THE FLORIDA GAME AND FRESH WATER FISH COMMISSION AND/OR U.S. FISH AND WILDLIFE SERVICE FOR APPROPRIATE GUIDANCE, RECOMMENDATIONS, AND/OR NECESSARY PERMITS TO AVOID IMPACTS TO LISTED SPECIES.
14. THE PERMITTEE SHALL COMPLY WITH THE FOLLOWING MANATEE PROTECTION CONSTRUCTION CONDITIONS:
 - A) THE PERMITTEE SHALL INSTRUCT ALL PERSONNEL ASSOCIATED WITH THE PROJECT OF THE POTENTIAL PRESENCE OF MANATEES AND THE NEED TO AVOID COLLISION WITH MANATEES. ALL CONSTRUCTION PERSONNEL ARE RESPONSIBLE FOR OBSERVING WATER-RELATED ACTIVITIES FOR THE PRESENCE OF MANATEE(S).
 - B) THE PERMITTEE SHALL ADVISE ALL CONSTRUCTION PERSONNEL THAT THERE ARE CIVIL AND CRIMINAL PENALTIES FOR HARMING, HARASSING, OR KILLING MANATEES WHICH ARE PROTECTED UNDER THE MARINE MAMMAL PROTECTION ACT OF 1972, THE ENDANGERED SPECIES ACT OF 1973, AND THE FLORIDA MANATEE SANCTUARY ACT.
 - C) SILTATION BARRIERS SHALL BE MADE OF MATERIAL IN WHICH MANATEES CANNOT BECOME ENTANGLED, ARE PROPERLY SECURED, AND ARE REGULARLY MONITORED TO AVOID MANATEE ENTRAPMENT. BARRIERS MUST NOT BLOCK MANATEE ENTRY TO OR EXIT FROM ESSENTIAL HABITAT.

D) ALL VESSELS ASSOCIATED WITH THE CONSTRUCTION PROJECT SHALL OPERATE AT "NO WAKE/IDLE" SPEEDS AT ALL TIMES WHILE IN THE CONSTRUCTION AREA AND WHILE IN WATER WHERE THE DRAFT OF THE VESSEL PROVIDES LESS THAN FOUR-FEET CLEARANCE FROM THE BOTTOM. ALL VESSELS WILL FOLLOW ROUTES OF DEEP WATER WHENEVER POSSIBLE.

E) IF MANATEES OR SEA TURTLES ARE SEEN WITHIN 100 YARDS OF THE ACTIVE DAILY CONSTRUCTION/DREDGING OPERATION OR VESSEL MOVEMENT, ALL APPROPRIATE PRECAUTIONS SHALL BE IMPLEMENTED TO ENSURE PROTECTION OF THE MANATEE OR SEA TURTLE. THESE PRECAUTIONS SHALL INCLUDE THE OPERATION OF ALL MOVING EQUIPMENT NO CLOSER THAN 50 FEET OF A MANATEE OR SEA TURTLE. OPERATION OF ANY EQUIPMENT CLOSER THAN 50 FEET TO A MANATEE OR SEA TURTLE SHALL NECESSITATE IMMEDIATE SHUTDOWN OF THAT EQUIPMENT. ACTIVITIES WILL NOT RESUME UNTIL THE MANATEE OR SEA TURTLE HAS DEPARTED THE PROJECT AREA OF ITS OWN VOLITION.

F) ANY COLLISION WITH AND/OR INJURY TO A MANATEE SHALL BE REPORTED IMMEDIATELY TO THE FLORIDA MARINE PATROL AT 1-800-DIAL-FMP (1-800-342-5367). COLLISION AND/OR INJURY SHOULD ALSO BE REPORTED TO THE U.S. FISH AND WILDLIFE SERVICE IN VERO BEACH (1-407-562-3909).

G) TEMPORARY SIGNS CONCERNING MANATEES SHALL BE POSTED PRIOR TO AND DURING ALL CONSTRUCTION/DREDGING ACTIVITIES. ALL SIGNS ARE TO BE REMOVED BY THE PERMITTEE UPON COMPLETION OF THE PROJECT. A SIGN MEASURING AT LEAST THREE (3) FEET BY FOUR (4) FEET WHICH READS "CAUTION: MANATEE AREA" WILL BE POSTED IN A LOCATION PROMINENTLY VISIBLE TO WATER RELATED CONSTRUCTION CREWS. A SECOND SIGN SHOULD BE POSTED IF VESSELS ARE ASSOCIATED WITH THE CONSTRUCTION, AND SHOULD BE PLACED VISIBLE TO THE VESSEL OPERATOR. THE SECOND SIGN SHOULD BE AT LEAST 8 1/2 INCHES BY 11 INCHES AND SHOULD READ "CAUTION: MANATEE HABITAT". IDLE SPEED IS REQUIRED IF OPERATING A VESSEL IN THE CONSTRUCTION AREA. ALL EQUIPMENT MUST BE SHUTDOWN IF A MANATEE COMES WITHIN 50 FEET OF OPERATION. ANY COLLISION WITH AND/OR INJURY TO A MANATEE SHALL BE REPORTED IMMEDIATELY TO THE FLORIDA MARINE PATROL AT 1-800-DIAL-FMP (1-800-342-5367). THE U.S. FISH AND WILDLIFE SERVICE SHOULD ALSO BE CONTACTED IN VERO BEACH (1-407-562-3909)."

15. UPON SUBMITTAL OF AN APPLICATION FOR CONSTRUCTION APPROVAL FOR FUTURE PHASES, THE PERMITTEE SHALL SUBMIT DRAFT COPIES OF PRELIMINARY PLAT(S), DEED RESTRICTIONS, CONSERVATION EASEMENTS OR OTHER DOCUMENTATION WHICH DEDICATES THE WETLAND PRESERVATION/MITIGATION AREAS, UPLAND BUFFER ZONES, AND/OR UPLAND PRESERVATION AREAS AS CONSERVATION AND COMMON AREAS. RESTRICTIONS FOR THE USE OF THE CONSERVATION/Common AREAS SHALL STIPULATE:

THE WETLAND PRESERVATION/MITIGATION AREAS, UPLAND BUFFER ZONES, AND/OR UPLAND PRESERVATION AREAS ARE HEREBY DEDICATED AS CONSERVATION AND COMMON AREAS. THE CONSERVATION/Common AREAS SHALL BE THE PERPETUAL RESPONSIBILITY OF PERMITTEE AND MAY IN NO WAY BE ALTERED FROM THEIR NATURAL STATE AS DOCUMENTED IN THE PERMIT FILE, WITH THE EXCEPTION OF PERMITTED RESTORATION ACTIVITIES. ACTIVITIES PROHIBITED WITHIN THE CONSERVATION AREAS INCLUDE,

BUT ARE NOT LIMITED TO: CONSTRUCTION OR PLACING SOIL OR OTHER SUBSTANCES SUCH AS TRASH; REMOVAL OR DESTRUCTION OF TREES, SHRUBS, OR OTHER VEGETATION - WITH THE EXCEPTION OF EXOTIC/NUISANCE VEGETATION REMOVAL; EXCAVATION, DREDGING, OR REMOVAL OF SOIL MATERIAL; DIKING OR FENCING; AND ANY OTHER ACTIVITIES DETRIMENTAL TO DRAINAGE, FLOOD CONTROL, WATER CONSERVATION, EROSION CONTROL, OR FISH AND WILDLIFE HABITAT CONSERVATION OR PRESERVATION.

RECORDED COPIES OF PLATS, DEED RESTRICTIONS, CONSERVATION EASEMENTS OR OTHER APPROVED DOCUMENTATION SHALL BE SUBMITTED, CONCURRENT WITH ENGINEERING CERTIFICATION OF CONSTRUCTION COMPLETION.

16. IF DISTRICT STAFF DETERMINES FROM FIELD INSPECTION OR FROM ADDITIONAL INFORMATION PROVIDED BY THE APPLICANT THAT ADDITIONAL SEAGRASS OR MARINE ALGAE IMPACTS HAVE OCCURRED, THEN THE PERMITTEE SHALL PROVIDE A MITIGATION PLAN ACCEPTABLE TO THE DISTRICT WITHIN THIRTY (30) DAYS OF NOTIFICATION FROM THE DISTRICT.
17. IMMEDIATELY PRIOR TO CONSTRUCTION OF THE FISHING PIER AND BOAT DOCK, THE PERMITTEE SHALL FIELD LOCATE AND MARK THE EXACT LOCATION OF THE PIER AND DOCK. DISTRICT STAFF SHALL BE NOTIFIED TO VERIFY THE PROPOSED PIER AND DOCK FOOTPRINT TO AVOID AND MINIMIZE IMPACTS TO SEAGRASSES AND MARINE ALGAE.
18. WITHIN 30 DAYS OF COMPLETION OF CONSTRUCTION OF THE FISHING PIER AND BOAT DOCK, THE PERMITTEE SHALL SUBMIT A SEAGRASS SURVEY OF THE AREA IMMEDIATELY ADJACENT TO THE FISHING PIER AND BOAT DOCK (SIMILAR TO PRE-CONSTRUCTION SEAGRASS SURVEY-EXHIBIT 21).



Department of Environmental Protection

orig to PD
CF: DP (mury)

Lawton Chiles
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Virginia B. Wetherell
Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

January 12, 1998

U. S. Army Corps of Engineers
c/o Mr. Richard E. Bonner, P.E.
Jacksonville District
Post Office Box 4970
Jacksonville, Florida 32232-0019

Permit No. 502141369, Palm Beach County
U. S. Army Corps of Engineers, Jacksonville District
Port of Palm Beach Entrance Channel Maintenance Dredging

Dear Mr. Bonner:

- Your request to modify this permit has been received and reviewed by Department staff. The proposed modifications are to allow placement of non-beach quality dredged material in the Port
1. of Palm Beach upland disposal area located at the southern end of Peanut Island; to revise the
 2. construction profile of the beach disposal site to allow placement of sand above MHW; and to
 3. allow overflow from hopper barges when beach quality sand is dredged within the turning basin or channels west of the inlet.

Use of the Peanut Island disposal site is requested to provide an alternative to the Ocean Dredged Material Disposal Site (ODMDS) when use of the ODMDS is either prohibited or deemed not feasible for the quantity/quality of material dredged from the project area. The island site has historically been utilized for disposal by the Corps. The Port is currently authorized to utilize this site pursuant to Permits Nos. 501733439 and 501964059. Best management practices, including use of the authorized pipeline corridor for the dredge discharge pipe, shall be implemented during all disposal operations to minimize impacts to seagrass beds near the island.

Beach disposal site capacity shall be increased by raising the proposed construction berm height from +2.87 ft. MLW (equivalent to the MHW elevation) to +8.66 ft. MLW. Beach template width will be established a fixed distance from the Department's DNR reference monument baseline. This modification will allow additional beach quality material to be placed landward of MHW, thereby increasing turtle nesting habitat and the sand budget for southerly littoral drift. The new equilibrium toe-of-fill, which is not expected to exceed -15 ft. MLW, may temporarily increase coverage of the nearshore patchy rock outcroppings located between DNR monuments

Notice of Permit Modification
U. S. Army Corps of Engineers, Jacksonville District
Port of Palm Beach Entrance Channel Maintenance Dredging
Permit No. 502141369
Page 2

R-78 and R-79. However, beach disposal activities should not impact the continuous hardbottom/reef areas located further offshore. Permit marine turtle protection conditions have been modified to include additional post-construction monitoring to insure that sand placement above MHW will not interfere with turtle nesting in subsequent years. The Town of Palm Beach shall be responsible for post-construction monitoring, pursuant to Permits Nos. 502739539 and DBS9A0352 PB, when sand is placed at the alternate Mid-Town Beach Restoration Project site (approved by Permit No. 502141369 modification on November 13, 1996).

The attached Peanut Island disposal site drawing shall be added to the permit and the new beach template and typical beach fill cross-sectional drawings shall replace Permit Drawing No. 7 of 7 (previously modified on May 9, 1996).

The Project Description is amended as follows:

To maintenance dredge the Port of Palm Beach entrance channel and associated settling basin, inner channel (Cuts 1 and 2), the turning basin, and the extended turning basin by: excavating the entrance channel to -35 ft. MLW plus 2 ft. advanced maintenance and 2 ft. allowable overdepth, the settling basin to -35 ft. MLW, the inner channel and turning basin to -33 ft. MLW plus 2 ft. advanced maintenance and 2 ft. allowable overdepth, and the extended turning basin to -25 ft. MLW plus 2 ft. advanced maintenance, and disposing of all beach quality material in a beach disposal area which begins immediately south of the inlet's south jetty and extends 3000 ft. south of that jetty or at the alternate Mid-Town Beach Restoration Project site and disposing of the non-beach quality material in an offshore disposal site or the Peanut Island disposal site.

The following Specific Conditions are amended to reflect the currently requested project modifications and to clarify, combine, and correct previous modifications of this permit:

4. Best management practices shall be used at all times during construction to minimize turbidity at ~~both~~ the dredge, island disposal, and fill sites. At the beach fill site, these practices shall include constructing dikes parallel to the shore and landward of mean high water and discharging the fill material landward of these dikes. When pumping into the Peanut Island disposal site, pumping rates shall be controlled such that the site discharge does not violate State water quality standards at a distance of more than 100 meters downcurrent from the outfall. ~~These~~ All dikes shall be constructed and maintained in a manner that minimizes the discharge of turbid waters into waters of the State.

Notice of Permit Modification

U. S. Army Corps of Engineers, Jacksonville District

Port of Palm Beach Entrance Channel Maintenance Dredging

Permit No. 502141369

Page 3

8. The permittee shall undertake all practicable measures to protect natural resources in the project area from mechanical damage during dredging and disposal operations. This shall include but not be limited to the following: 1) dredges shall be anchored only within the bottom of the channel, settling basin, and turning basins; ~~and~~; 2) pipe and other dredging related equipment shall not be stored/stockpiled on or over seagrass beds or on or over hardbottom nor shall such equipment be stored/stockpiled in areas where it may drift into, onto, or over such natural resources; ~~and~~; 3) the pipeline corridor authorized pursuant to Permits Nos. 501733439 and 501964059 shall be utilized for disposal on Peanut Island. This corridor may be modified as necessary, upon approval by the DEP Southeast District Office, to minimize seagrass impacts. The Department may require the permittee to take corrective measures to restore any habitat damaged as a result of any phase of dredging or disposal operations.

9. To minimize impacts to the turbidity sensitive resources which surround the channels and turning basins, only a hydraulic (suction) dredge shall be used for all dredging conducted under this permit. If a hopper dredge is used and if the sediment is determined to be unsuitable for beach placement pursuant to Specific Conditions Nos. 5 and 6, no overflow from the dredge shall occur during dredging of material in the turning basin or in the channels west of the neck of the inlet itself. Overflow may only occur when the dredged material is determined to be beach quality or the dredge is within the confines of the inlet itself or in the Atlantic Ocean. No overflow shall occur while material is being transported from the dredging area to the disposal area. The permittee shall be responsible for maintenance of the dredge pipeline to insure that it does not leak. If a problem is discovered, the dredging operation shall cease immediately and not resume until repairs are completed.

12. f. ~~During the first year following placement of material,~~ Sand compaction monitoring shall be performed immediately following placement of material and again prior to March 1 for three subsequent years. If compaction measurements exceed 500 cone penetrometer units (CPU) as determined by monitoring, the beaches shall be plowed (tilled) to a depth of 36 inches. All tilling activity must be completed prior to March 1. If the project is completed during nesting season, tilling shall not be performed in areas where nests have been left in place or areas which have received relocated nests.

g. Visual surveys for escarpments along the project area shall be ~~made each year in February only if material has been deposited in the last six months~~ immediately after completion of the project and in February for three subsequent years. Results of the surveys shall be submitted to the Department by February 5. If necessary, escarpments which interfere with marine turtle nesting or which exceed

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Permit No. 502141369
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leveled to the natural beach contour to ensure that no escarpments are present on March 1. If the project is completed during the nesting season, such escarpments shall be leveled immediately, while protecting both nests which have been left *in situ* and any relocated nests.

- h. Reports on all nesting activity, marine turtle protection measures taken during construction, and nest success shall be provided for the initial nesting season following placement of material on the beach, and for a minimum of two additional nesting seasons. Monitoring of nesting activity shall include but not be limited to daily surveys enumerating nesting activity and evaluating hatching success in a statistically valid sample of *in situ* nests. All reports shall include hatching success of all relocated nests. Subsequent placement of material (after the initial event) will require similar monitoring unless written authorization to modify monitoring is provided by the Department of Natural Resources Environmental Protection. All marine turtle monitoring reports shall be submitted no later than 30 days after completion of all monitoring activities to the DNR DEP, 3900 Commonwealth Blvd., MS-245, Tallahassee, Florida 32399-3000.

13. The following conditions are included to protect manatees during dredging....(unchanged)

14. ~~Disposal may occur one time only in a near shore disposal area between the 24-foot MLW contour and 100 feet west of 28-foot MLW contour at the location shown on the attached permit drawing....(deleted and replaced by the following:)~~

The volume of dredged material placed at the alternate disposal site shall be limited to the amount which can be placed within the authorized berm elevation and seaward slope of the construction fill template approved for the Mid-Town Beach Restoration Project by Permit No. 50-2739539.

15. ~~Disposal of beach quality material at both nearshore sites shall begin at the southern limits and progress northward. Only material with less than 10% silt shall be placed in either site. (deleted and replaced by the following:)~~

Before any dredging equipment is brought to the alternate beach disposal area, the permittee shall mark the ends of the Sea Spray Avenue pipeline corridor with buoys to clearly identify its location.

16. ~~The following conditions are included to protect marine turtles during disposal at the site in 24 to 28 foot deep water....(deleted, one time only event)~~

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The Monitoring Required section of the permit is amended as follows:

MONITORING REQUIRED:

↳ Turbidity, NTUs

A. At the dredge site:

Compliance: 150 m. downcurrent of the point of dredging, within the densest portion of any visible turbidity plume, at surface, mid-depth, and 1 ft. above bottom.

Background: At least 300 m. upcurrent of the point of dredging, outside any visible turbidity plume and any influence of this project, at surface, mid-depth, and 1 ft. above bottom.

B. At the beach disposal site:

Compliance: 150 m. downcurrent of the discharge point, within the densest portion of any visible turbidity plume, at surface and mid-depth. If no plume is visible, samples shall be collected 150 m. downcurrent of the discharge point and 50 m. offshore.

Background: At least 300 m. upcurrent of the discharge point or at least 800 m. downcurrent of the discharge point, outside of any visible turbidity plume and any influence of this project at the same distance offshore as the compliance point.

C. ~~At the nearshore disposal sites:(deleted and replaced by the following:)~~
At the Peanut Island disposal site:

Compliance: 100 m. downcurrent of the discharge point, within the densest portion of any visible turbidity plume, at surface, mid-depth, and 1 ft. above bottom.

Background: At least 300 m. upcurrent of the discharge point, outside of any visible turbidity plume and any influence of this project, at surface, mid-depth, and 1 ft. above bottom.

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Frequency: Once daily after dredging or disposal site discharge has been continual for at least 1 hour.

The compliance locations given above shall be considered the limits of the temporary mixing zone for turbidity allowed during construction. If monitoring reveals turbidity levels at the compliance site 29 NTUs above the turbidity levels at the corresponding background site, construction activities shall cease immediately and not resume until corrective measures have been taken and turbidity has returned to acceptable levels. Any such occurrence shall also be immediately reported to the Department of Environmental ~~Regulation~~ Protection, Bureau of ~~Wetland Resource Management~~ Beaches and Coastal Systems in Tallahassee and the Southeast District office in West Palm Beach.

Monitoring reports shall be submitted to the Bureau of ~~Wetland Resource Management~~ Beaches and Coastal Systems in Tallahassee and to the Department of Environmental ~~Regulation~~ Protection, Southeast District office as specified in Specific Condition No. 7 of this permit. Failure to submit reports in a timely manner constitutes grounds for revocation of the permit.

Since the proposed modifications and permit condition corrections are not expected to result in any adverse environmental impact or water quality degradation, the permit is hereby modified and additional activities are authorized as requested. By copy of this letter and the attached drawings, we are notifying all necessary parties of the modifications.

This letter of approval does not alter the May 24, 2003 expiration date or other Specific Conditions, General Conditions, or monitoring requirements of the permit. This letter and the accompanying drawings must be attached to the original permit.

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) in accordance with Sections 120.569 and 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000. Petitions filed by the permittee and the parties listed below must be filed within 14 days of receipt of this letter. Petitioner shall mail a copy of the petition to the permittee at the address indicated above at the time of filing. Failure to file a petition (or a request for mediation, as discussed below) within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S.

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The Petition shall contain the following information:

- (a) The name, address, and telephone number of each petitioner, the permittee's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) A statement of how each petitioner's substantial interests are affected by the Department's action; or proposed action;
- (d) A statement of the material facts disputed by petitioner, if any;
- (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this letter. Persons whose substantial interests will be affected by any decision of the Department with regard to the permit have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

Any person may elect to pursue mediation by reaching a mediation agreement with all parties to the proceeding (which include the applicant, the Department, and any person who has filed a timely and sufficient petition for a hearing) and by showing how the substantial interests of each mediating party are affected by the Department's action or proposed action. The agreement must be filed in (received by) the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, by the same deadline as set forth above for the filing of a petition.

The agreement to mediate must include the following:

- (a) The names, addresses, and telephone numbers of any persons who may attend the mediation;
- (b) The name, address, and telephone number of the mediator selected by the parties, or a provision for selecting a mediator within a specified time;

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- (c) The agreed allocation of the costs and fees associated with the mediation;
- (d) The agreement of the parties on the confidentiality of discussions and documents introduced during mediation;
- (e) The date, time and place of the first mediation session, or a deadline for holding the first session, if no mediator has yet been chosen;
- (f) The name of each party's representative who shall have authority to settle or recommend settlement;
- (g) Either an explanation of how the substantial interests of each mediating party will be affected by the action or proposed action addressed in this notice of intent or a statement clearly identifying the petition for hearing that each party has already filed, and incorporating it by reference; and
- (h) The signatures of all parties or their authorized representatives.

As provided in Section 120.573, F.S., the timely agreement of all parties to mediate will toll the time limitation imposed by Sections 120.569 and 120.57, F.S., for requesting and holding an administrative hearing. Unless otherwise agreed by the parties, the mediation must be concluded within 60 days of the execution of the agreement. If mediation results in settlement of the administrative dispute, the Department must enter a final order incorporating the agreement of the parties. Persons whose substantial interests will be affected by such a modified final decision of the Department have a right to petition for a hearing only in accordance with the requirements for such petitions set forth above, and must therefore file their petitions within 14 days of receipt of this letter. If mediation terminates without settlement of the dispute, the Department shall notify all parties in writing that the administrative hearing processes under Sections 120.569 and 120.57, F.S., remain available for disposition of the dispute, and the notice will specify the deadlines that then will apply for challenging the agency action and electing remedies under those two statutes.

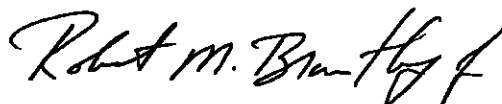
This Notice constitutes final agency action unless a petition is filed or all parties reach a written agreement on mediation in accordance with the above paragraphs, or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 62-103.070, F.A.C. Upon timely filing of a petition, written agreement on mediation, or a request for an extension of time, this Notice will not be effective until further Order of the Department.

Any party to this letter has the right to seek judicial review of the Order pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000; and by filing a

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copy with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Notice of Permit Modification is filed with the Clerk of the Department.

Sincerely,



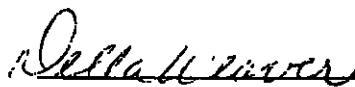
Robert M. Brantly, Jr., P.E.
Professional Engineering Administrator
Bureau of Beaches and Coastal Systems

RMB/lm

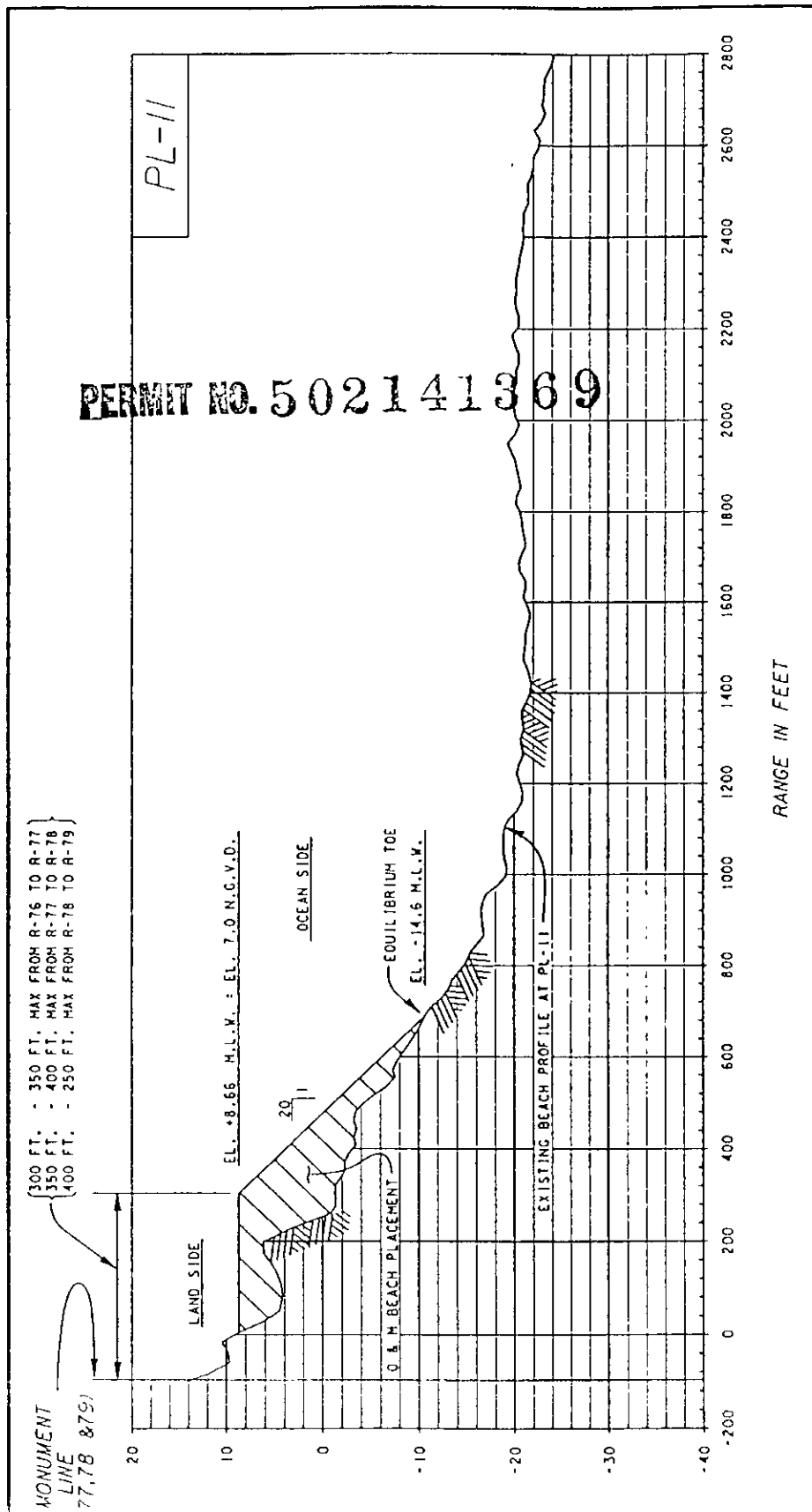
cc: Larry O'Donnell, DEP, Southeast District
Peter Cocotos, DEP, OGC
David Arnold, DEP, BPSM
Florida Marine Patrol
Jim Riley, USACOE, Jacksonville
Glenn Schuster, USACOE, Jacksonville
Robert J. Doney, Town of Palm Beach
Richard E. Walesky, Palm Beach County DERM
Jim Moore, Gee & Jenson E-A-P, Inc.
Patrick Rose, Save the Manatee Club
Dr. Sanford F. Kuvin
Jim Koontz
Dick P. Bresee

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section 120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

 11/12/98
Deputy Clerk Date

TYPICAL BEACH FILL CROSS SECTION



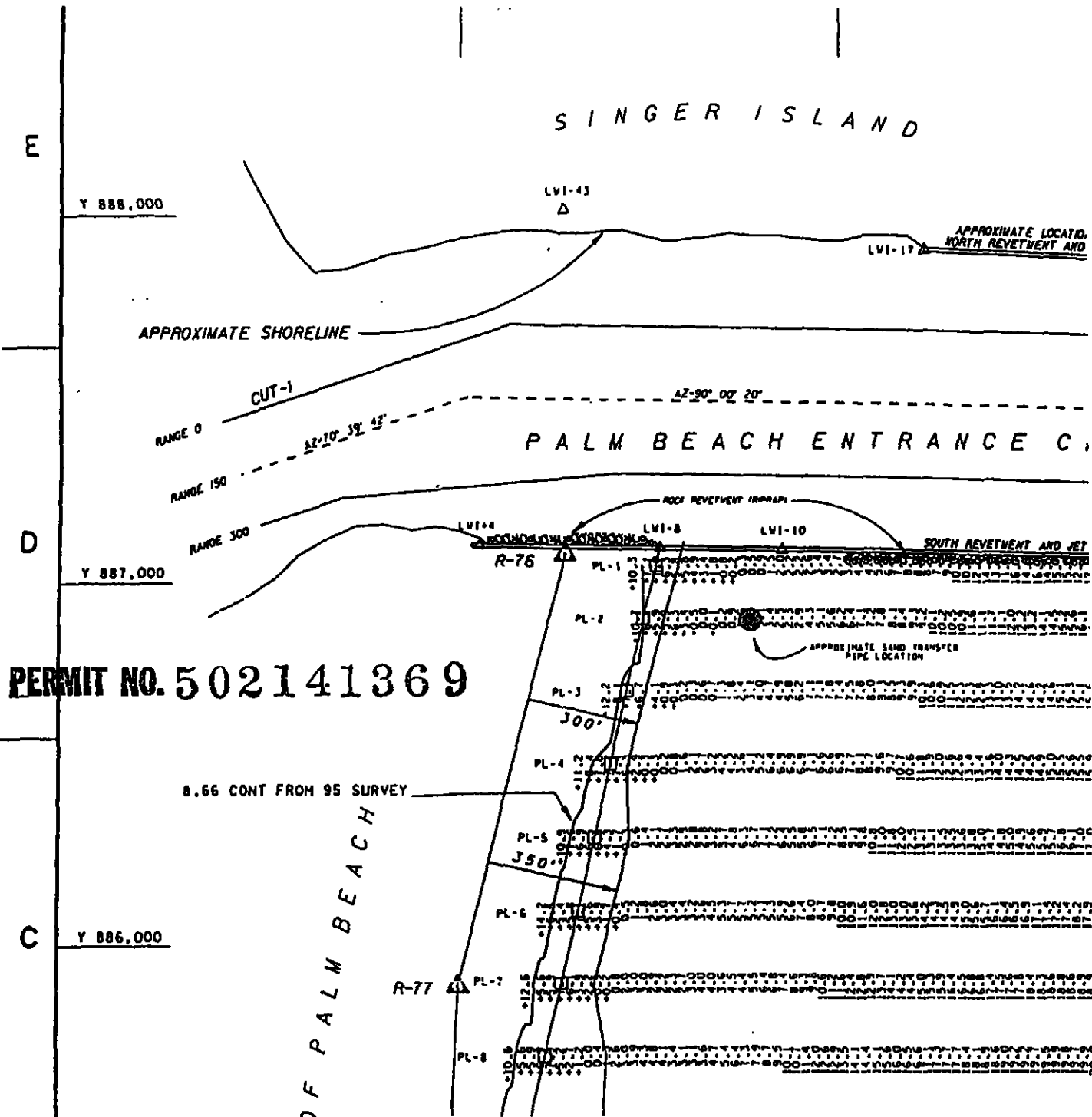
PALM BEACH HARBOR

RECEIVED

AUG 19 1997

BUREAU OF BEACH
& COASTAL SYSTEMS

NEW BEACH TEMPLATE (TOP OF BERM)



2 March 2000

Regulatory Division
Enforcement Branch
199603357
MODIFICATION

Palm Beach County
c/o Gee & Jenson, Inc.
Attn: J. B. Frost
One Harvard Circle
West Palm Beach, Florida 33409

Dear Mr. Frost:

Reference is made to your request to modify Department of the Army permit number 199603357(IP-IP), on behalf of Palm Beach County. The proposed modification is to fill 0.03 acres of red mangrove wetlands located on the access road on Peanut Island. The project is located on the southern western portion of Peanut Island, on Lake Worth, Section 34, Township 42 South, Range 43 East, Palm Beach County, Florida.

The purpose of this modification is to allow construction of an access road that will connect the staging area to the Island's perimeter road. The access road was previously noted on the original permit, but recent field investigation discovered additional wetlands that would be impacted by this work. The access road is to provide materials for a proposed restoration project that will occur on Peanut Island. As mitigation for the wetland impact, Palm Beach County is proposing to enhance 0.04 acres of an adjacent wetland by removing exotic plants and planting 145 red mangrove trees. All other aspects of the permit will remain the same.

The impact of the proposed work on navigation and the environment have been evaluated and found to be insignificant. The permit is hereby modified as noted above including the addition of the following special condition:

The permittee agrees to compensate for this wetland impact by enhancing 0.04 acres of wetlands as depicted in the attached

permit drawing. This wetland enhancement will occur within the first 6-months upon commencement of construction and will require removal of all exotics and planting 145 red mangroves seedlings at 3-foot o.c. The permittee agrees to submit a baseline report with photos within 30 days of planting and an annual report for three years. All reports will be submitted to the U.S. Army Corps of Engineers, Enforcement Branch, P.O. Box 4970, Jacksonville, FL 32232. The mitigation will be considered successful if after two years 90 percent of the planted seedlings indicate normal growth and no exotics are present.

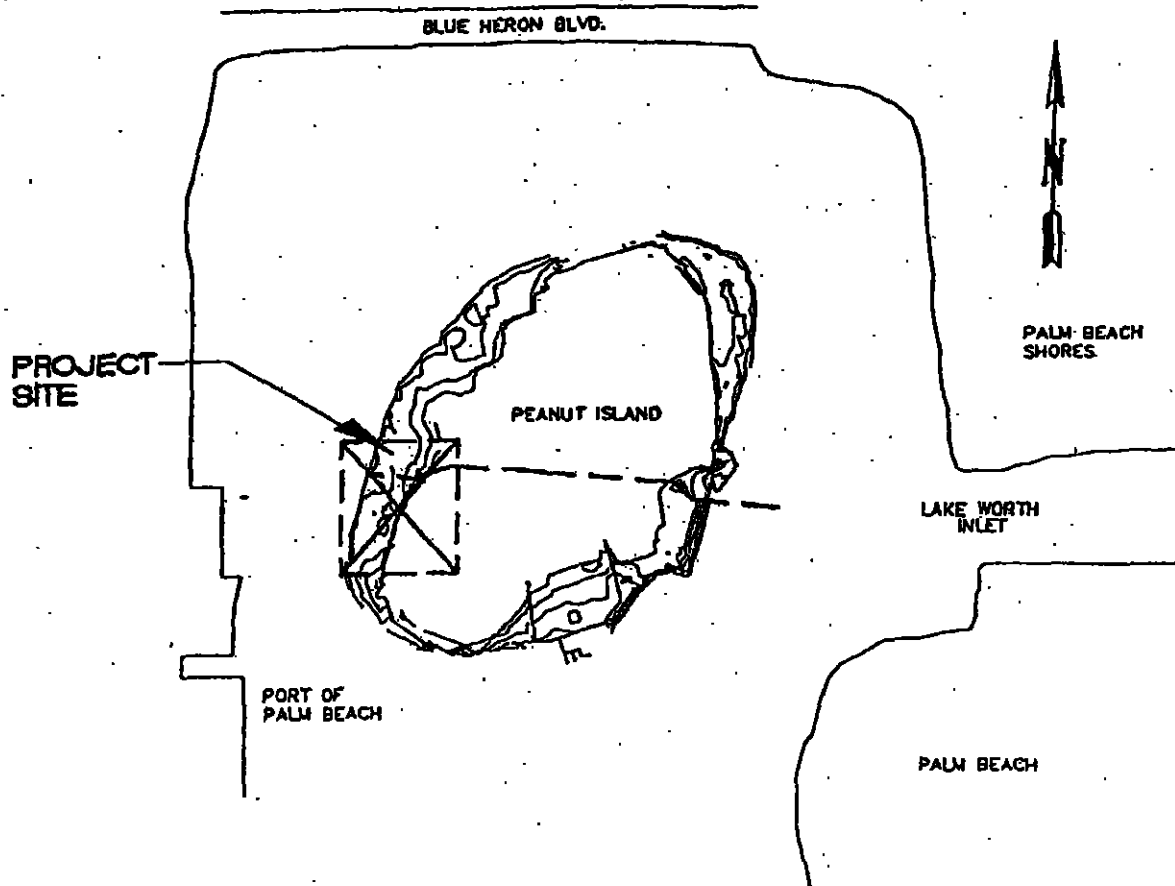
All other conditions and limitations of the permit remain in effect. You should attach this letter to the original permit. Thank you for your cooperation with our permit program.

BY THE AUTHORITY OF THE SECRETARY OF THE ARMY:

62 3/2
Joe R. Miller
Colonel, U.S. Army
District Engineer

Enclosure

000113



LOCATION MAP

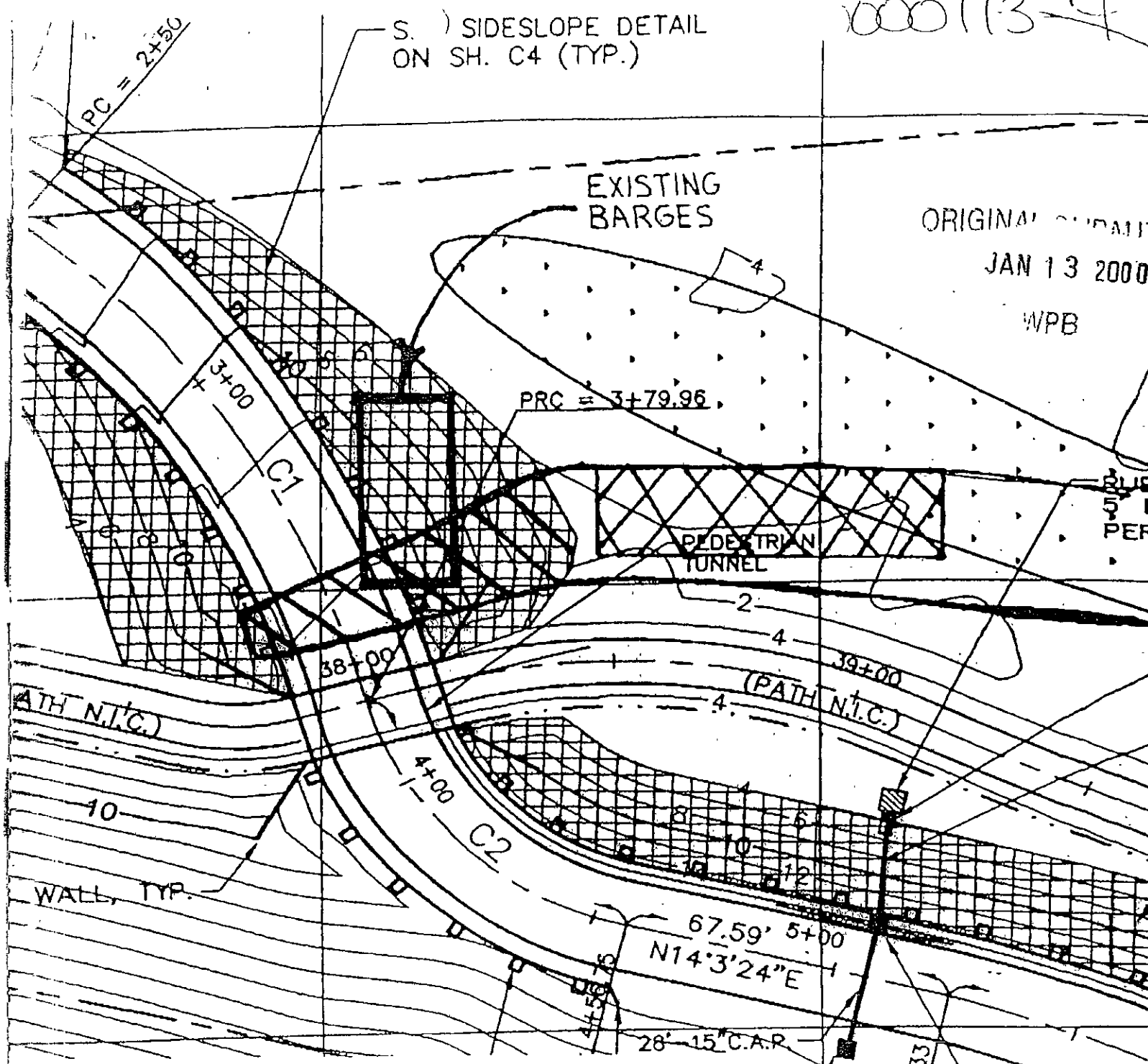
ORIGINAL SUBMITTAL

JAN 13 2000

0000113-4

S. SIDESLOPE DETAIL
ON SH. C4 (TYP.)

ORIGINAL DATE
JAN 13 2000
WPB



IMPACTED AREA
(0.03 Ac.)



REMEDIAL AREA (REMOVAL OF EXOTIC SPECIES
& PLANTING OF RED MANGROVES)
(0.04 Ac.)

INLET C2
TYPE "CG"
STA 5+08
RIM EL 14.1
INLET TO 2

PROPOSED TYP
"F" CURB & CI
SEE DETAIL SH

PLANT SPECS. 178

TYPE	AREA	SPACING	QUANTITY
RED MANGROVE	0.04 AC.	3' O.C.	145



FORM 00157
Rev 08/95

**SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE**

PERMIT MODIFICATION NO. 50-03713-P

DATE ISSUED: OCTOBER 12, 2000

PERMITTEE: FLORIDA INLAND NAVIGATION DISTRICT
(PEANUT ISLAND ENVIRONMENTAL RESTORATION (PH II))
1314 MARCINSKI ROAD,
JUPITER, FL 33477

PORT OF PALM BEACH
(PEANUT ISLAND ENVIRONMENTAL RESTORATION (PH II))
PO BOX 993,
RIVIERA BEACH, FL 33419

ORIGINAL PERMIT ISSUED: SEPTEMBER 12, 1996

ORIGINAL PROJECT DESCRIPTION: AUTHORIZATION FOR THE CONSTRUCTION/OPERATION OF A SWM SYSTEM TO SERVE AN 80.4 ACRE RECREATIONAL PROJECT TO BE KNOWN AS PEANUT ISLAND PARK WITH TOTAL ON-SITE RETENTION.

APPROVED MODIFICATION : AUTHORIZATION FOR THE CONSTRUCTION/OPERATION OF A SWM SYSTEM TO SERVE AN 8.8 ACRE RECREATIONAL PROJECT TO BE KNOWN AS PEANUT ISLAND PARK WITH TOTAL ON-SITE RETENTION AND AUTHORIZATION FOR WORK IN STATE-OWNED SOVEREIGN SUBMERGED LANDS IN THE FORM OF A PUBLIC EASEMENT FOR THE CONSTRUCTION OF AN ACCESS CHANNEL.

PROJECT LOCATION: PALM BEACH COUNTY, SECTION 34 TWP 42S RGE 43E

PERMIT DURATION: Five years from the date issued to complete construction of the surface water management system as authorized herein. See attached Rule 40E-4.321, Florida Administrative Code.

This Permit Modification is approved pursuant to Application No. 000324-9, dated March 20, 2000. Permittee agrees to hold and save the South Florida Water Management District and its successors harmless from any and all damages, claims or liabilities which may arise by reason of the construction, operation, maintenance or use of any activities authorized by this Permit. This Permit is issued under the provisions of Chapter 373, Part IV Florida Statutes(F.S.), and the Operating Agreement Concerning Regulation Under Part IV, Chapter 373 F.S. between South Florida Water Management District and the Department of Environmental Protection. Issuance of this Permit constitutes certification of compliance with state water quality standards where necessary pursuant to Section 401, Public Law 92-500, 33 USC Section 1341, unless this Permit is issued pursuant to the net improvement provisions of Subsections 373.414(1)(b), F.S., or as otherwise stated herein.

This Permit Modification may be revoked, suspended, or modified at any time pursuant to the appropriate provisions of Chapter 373, F.S., and Sections 40E-4.351(1), (2), and (4), Florida Administrative Code (F.A.C.). This Permit Modification may be transferred pursuant to the appropriate provisions of Chapter 373, F.S., and Sections 40E-1.6107(1) and (2), and 40E-4.351(1), (2), and (4), F.A.C.

All specifications and special and limiting/general conditions attendant to the original Permit, unless specifically rescinded by this or previous modifications, remain in effect.

This Permit Modification shall be subject to the General Conditions set forth in Rule 40E-4.381, F.A.C., unless waived or modified by the Governing Board. The Application, and Environmental Resource Permit Staff Review Summary of the Application, including all conditions, and all plans and specifications incorporated by reference, are a part of this Permit Modification. All activities authorized by this Permit Modification shall be implemented as set forth in the plans, specifications, and performance criteria as set forth and incorporated in the Environmental Resource Permit Staff Review Summary. Within 30 days after completion of construction of the permitting activity, the Permittee shall submit a written statement of completion and certification by a registered professional engineer or other appropriate individual, pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-4.361 and 40E-4.381, F.A.C.

In the event the property is sold or otherwise conveyed, the Permittee will remain liable for compliance with this Permit until transfer is approved by the District pursuant to Rule 40E-1.6107, F.A.C.

SPECIAL AND GENERAL CONDITIONS ARE AS FOLLOWS:

SEE PAGES 2 - 6 OF 9 (31 SPECIAL CONDITIONS).

SEE PAGES 7 - 9 OF 9 (19 GENERAL CONDITIONS).

PERMIT MODIFICATION APPROVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT

FILED WITH THE CLERK OF THE
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

ON 18-Oct-2000
BY Jennifer Krumlauf
DEPUTY CLERK

BY [Signature]
ASSISTANT SECRETARY

PAGE 1 OF 9

SPECIAL CONDITIONS

1. MINIMUM BUILDING FLOOR ELEVATION: 9 FEET NGVD.
2. DISCHARGE FACILITIES: TOTAL ON-SITE RETENTION.
3. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION, SHOALING OR WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.
4. MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.
5. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT ADDITIONAL WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.
6. FACILITIES OTHER THAN THOSE STATED HEREIN SHALL NOT BE CONSTRUCTED WITHOUT AN APPROVED MODIFICATION OF THIS PERMIT.
7. ALL SPECIAL CONDITIONS PREVIOUSLY STIPULATED BY PERMIT NUMBER 50-03713-P REMAIN IN EFFECT UNLESS OTHERWISE REVISED AND SHALL APPLY TO THIS MODIFICATION.
8. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF PALM BEACH COUNTY PARKS AND RECREATION DEPARTMENT.
9. THE SFWMD RESERVES THE RIGHT TO REQUIRE REMEDIAL MEASURES TO BE TAKEN BY THE PERMITTEE IF WETLAND AND/OR UPLAND MONITORING OR OTHER INFORMATION DEMONSTRATES THAT ADVERSE IMPACTS TO PROTECTED, CONSERVED, INCORPORATED OR MITIGATED WETLANDS OR UPLANDS HAVE OCCURRED DUE TO PROJECT RELATED ACTIVITIES.
10. ACTIVITIES ASSOCIATED WITH IMPLEMENTATION OF THE WETLAND MITIGATION, MONITORING AND MAINTENANCE SHALL BE IN ACCORDANCE WITH THE FOLLOWING WORK SCHEDULE. ANY DEVIATION FROM THESE TIME FRAMES SHALL REQUIRE FORMAL SFWMD APPROVAL. SUCH REQUESTS MUST BE MADE IN WRITING AND SHALL INCLUDE (1) REASON FOR THE MODIFICATION; (2) PROPOSED START/FINISH DATES; AND (3) PROGRESS REPORT ON THE STATUS OF THE EXISTING MITIGATION EFFORTS.

COMPLETION DATE	ACTIVITY
JANUARY 1, 2002	BASELINE MONITORING REPORT
JUNE 1, 2002	EXOTIC VEGETATION REMOVAL AND CREATION OF MANGROVE FLUSHING CHANNELS
JULY 1, 2002	TIME ZERO MONITORING REPORT
JULY 1, 2003	FIRST MONITORING REPORT
JULY 1, 2004	SECOND MONITORING REPORT
JULY 1, 2005	THIRD MONITORING REPORT
JULY 1, 2006	FOURTH MONITORING REPORT
JULY 1, 2007	FIFTH MONITORING REPORT

11. ENDANGERED SPECIES, THREATENED SPECIES, OR SPECIES OF SPECIAL CONCERN HAVE BEEN OBSERVED ONSITE AND/OR THE PROJECT CONTAINS SUITABLE HABITAT FOR THESE SPECIES. IT SHALL BE THE PERMITTEE'S RESPONSIBILITY TO COORDINATE WITH THE FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION AND/OR U.S. FISH AND WILDLIFE SERVICE FOR APPROPRIATE GUIDANCE, RECOMMENDATIONS, AND/OR NECESSARY PERMITS TO AVOID IMPACTS TO LISTED SPECIES.
12. THE PERMITTEE SHALL COMPLY WITH THE FOLLOWING MANATEE PROTECTION CONSTRUCTION

CONDITIONS:

A) THE PERMITTEE SHALL INSTRUCT ALL PERSONNEL ASSOCIATED WITH THE PROJECT OF THE POTENTIAL PRESENCE OF MANATEES AND THE NEED TO AVOID COLLISION WITH MANATEES. ALL CONSTRUCTION PERSONNEL ARE RESPONSIBLE FOR OBSERVING WATER-RELATED ACTIVITIES FOR THE PRESENCE OF MANATEE(S).

B) THE PERMITTEE SHALL ADVISE ALL CONSTRUCTION PERSONNEL THAT THERE ARE CIVIL AND CRIMINAL PENALTIES FOR HARMING, HARASSING, OR KILLING MANATEES WHICH ARE PROTECTED UNDER THE MARINE MAMMAL PROTECTION ACT OF 1972, THE ENDANGERED SPECIES ACT OF 1973, AND THE FLORIDA MANATEE SANCTUARY ACT.

C) SILTATION BARRIERS SHALL BE MADE OF MATERIAL IN WHICH MANATEES CANNOT BECOME ENTANGLED, ARE PROPERLY SECURED, AND ARE REGULARLY MONITORED TO AVOID MANATEE ENTRAPMENT. BARRIERS MUST NOT BLOCK MANATEE ENTRY TO OR EXIT FROM ESSENTIAL HABITAT.

D) ALL VESSELS ASSOCIATED WITH THE CONSTRUCTION PROJECT SHALL OPERATE AT "NO WAKE/IDLE" SPEEDS AT ALL TIMES WHILE IN THE CONSTRUCTION AREA AND WHILE IN WATER WHERE THE DRAFT OF THE VESSEL PROVIDES LESS THAN FOUR-FEET CLEARANCE FROM THE BOTTOM. ALL VESSELS WILL FOLLOW ROUTES OF DEEP WATER WHENEVER POSSIBLE.

E) IF MANATEES OR SEA TURTLES ARE SEEN WITHIN 100 YARDS OF THE ACTIVE DAILY CONSTRUCTION/DREDGING OPERATION OR VESSEL MOVEMENT, ALL APPROPRIATE PRECAUTIONS SHALL BE IMPLEMENTED TO ENSURE PROTECTION OF THE MANATEE OR SEA TURTLE. THESE PRECAUTIONS SHALL INCLUDE THE OPERATION OF ALL MOVING EQUIPMENT NO CLOSER THAN 50 FEET OF A MANATEE OR SEA TURTLE. OPERATION OF ANY EQUIPMENT CLOSER THAN 50 FEET TO A MANATEE OR SEA TURTLE SHALL NECESSITATE IMMEDIATE SHUTDOWN OF THAT EQUIPMENT. ACTIVITIES WILL NOT RESUME UNTIL THE MANATEE OR SEA TURTLE HAS DEPARTED THE PROJECT AREA OF ITS OWN VOLITION.

F) ANY COLLISION WITH AND/OR INJURY TO A MANATEE SHALL BE REPORTED IMMEDIATELY TO THE FLORIDA MARINE PATROL AT 1-800-DIAL-FMP (1-800-342 5367). COLLISION AND/OR INJURY SHOULD ALSO BE REPORTED TO THE U.S. FISH AND WILDLIFE SERVICE IN VERO BEACH (1-407-562-3909).

G) TEMPORARY SIGNS CONCERNING MANATEES SHALL BE POSTED PRIOR TO AND DURING ALL CONSTRUCTION/DREDGING ACTIVITIES. ALL SIGNS ARE TO BE REMOVED BY THE PERMITTEE UPON COMPLETION OF THE PROJECT. A SIGN MEASURING AT LEAST THREE (3) FEET BY FOUR (4) FEET WHICH READS "CAUTION: MANATEE AREA" WILL BE POSTED IN A LOCATION PROMINENTLY VISIBLE TO WATER RELATED CONSTRUCTION CREWS. A SECOND SIGN SHOULD BE POSTED IF VESSELS ARE ASSOCIATED WITH THE CONSTRUCTION, AND SHOULD BE PLACED VISIBLE TO THE VESSEL OPERATOR. THE SECOND SIGN SHOULD BE AT LEAST 8 1/2 INCHES BY 11 INCHES AND SHOULD READ "CAUTION: MANATEE HABITAT". IDLE SPEED IS REQUIRED IF OPERATING A VESSEL IN THE CONSTRUCTION AREA. ALL EQUIPMENT MUST BE SHUTDOWN IF A MANATEE COMES WITHIN 50 FEET OF OPERATION. ANY COLLISION WITH AND/OR INJURY TO A MANATEE SHALL BE REPORTED IMMEDIATELY TO THE FLORIDA MARINE PATROL AT 1-800-DIAL-FMP (1-800-342-5367). THE U.S. FISH AND WILDLIFE SERVICE SHOULD ALSO BE CONTACTED IN VERO BEACH (1-407-562-3909)."

13. IF THE PROJECT DESIGN IS CHANGED AS A RESULT OF OTHER AGENCY REQUIREMENTS, AN ENVIRONMENTAL RESOURCE PERMIT MODIFICATION MAY BE REQUIRED. THE PERMITTEE SHALL NOTIFY SFWMD STAFF OF DESIGN CHANGES REQUIRED BY OTHER AGENCIES FOR A DETERMINATION OF ANY NECESSARY PERMIT MODIFICATIONS.
14. ANY FUTURE CHANGES IN LAND USE OR TREATMENT OF WETLANDS AND/OR UPLAND BUFFER/COMPENSATION AREAS MAY REQUIRE AN ENVIRONMENTAL RESOURCE PERMIT MODIFICATION AND ADDITIONAL ENVIRONMENTAL REVIEW BY DISTRICT STAFF. PRIOR TO THE PERMITTEE INSTITUTING ANY FUTURE CHANGES NOT AUTHORIZED BY THIS PERMIT, THE

PERMITTEE SHALL NOTIFY THE SFWMD OF SUCH INTENTIONS FOR A DETERMINATION OF ANY NECESSARY PERMIT MODIFICATIONS.

15. THE WETLAND CONSERVATION AREAS AND BUFFER ZONES SHOWN ON EXHIBIT(S) 5 SHALL BE PLACED UNDER A CONSERVATION EASEMENT IN FAVOR OF THE SFWMD. THESE AREAS MAY IN NO WAY BE ALTERED FROM THEIR NATURAL STATE. ACTIVITIES PROHIBITED WITHIN THE CONSERVATION AREAS INCLUDE, BUT ARE NOT LIMITED TO: CONSTRUCTION OR PLACING OF BUILDINGS ON OR ABOVE THE GROUND; DUMPING OR PLACING SOIL OR OTHER SUBSTANCES SUCH AS TRASH; REMOVAL OR DESTRUCTION OF TREES, SHRUBS, OR OTHER VEGETATION - WITH THE EXCEPTION OF EXOTIC/NUISANCE VEGETATION REMOVAL; EXCAVATION, DREDGING, OR REMOVAL OF SOIL MATERIAL; DIKING OR FENCING; AND ANY OTHER ACTIVITIES DETRIMENTAL TO DRAINAGE, FLOOD CONTROL, WATER CONSERVATION, EROSION CONTROL, OR FISH AND WILDLIFE HABITAT CONSERVATION OR PRESERVATION.

16. NO LATER THAN NOVEMBER 30, 2000, THE PERMITTEE SHALL SUBMIT A RECORDED COPY OF THE CONSERVATION EASEMENT TO THE SFWMD ENVIRONMENTAL RESOURCE COMPLIANCE STAFF IN THE SERVICE CENTER WHERE THE APPLICATION WAS SUBMITTED. THE RECORDED EASEMENT SHALL BE IN SUBSTANTIAL CONFORMANCE WITH EXHIBIT 5. ANY PROPOSED MODIFICATIONS TO THE APPROVED FORM MUST RECEIVE PRIOR WRITTEN CONSENT FROM THE DISTRICT.

THE EASEMENT SHALL BE FREE OF ENCUMBRANCES OR INTERESTS WHICH THE DISTRICT DETERMINES ARE CONTRARY TO THE INTENT OF THE EASEMENT. IN THE EVENT IT IS LATER DETERMINED THAT THERE ARE ENCUMBRANCES OR INTERESTS IN THE EASEMENT WHICH THE DISTRICT DETERMINES ARE CONTRARY TO THE INTENT OF THE EASEMENT, THE PERMITTEE SHALL BE REQUIRED TO PROVIDE RELEASE OR SUBORDINATION OF SUCH ENCUMBRANCES OR INTERESTS.

17. PALM BEACH COUNTY SHALL BE RESPONSIBLE FOR THE COMPLETION OF THE FIVE-YEAR MONITORING PROGRAM FOR THE MANGROVE ENHANCEMENT AREAS AND THE SEAGRASS CREATION AREA. PALM BEACH COUNTY SHALL ALSO BE RESPONSIBLE FOR THE PERPETUAL MAINTENANCE OF THE MANGROVE ENHANCEMENT AREAS, THE BUFFERS AND THE SEAGRASS CREATION AREA.
18. A MAINTENANCE PROGRAM SHALL BE IMPLEMENTED FOR THE MANGROVE ENHANCEMENT AREAS, THE BUFFERS AND THE SEAGRASS CREATION AREA ON A REGULAR BASIS TO ENSURE THE INTEGRITY AND VIABILITY OF THE CONSERVATION AREA(S) AS PERMITTED. MAINTENANCE SHALL BE CONDUCTED IN PERPETUITY TO ENSURE THAT THE CONSERVATION AREAS ARE MAINTAINED FREE FROM EXOTIC VEGETATION (AS DEFINED BY THE FLORIDA EXOTIC PEST PLANT COUNCIL) AND THAT OTHER NUISANCE SPECIES SHALL CONSTITUTE NO MORE THAN 10% OF TOTAL COVER.
19. THE PROJECT MUST COMPLY WITH APPLICABLE STATE WATER QUALITY STANDARDS, INCLUDING:
- A. 62-302.500 - MINIMUM CRITERIA FOR ALL SURFACE WATERS AT ALL PLACES AND AT ALL TIMES;
 - B. 62-302.510 - SURFACE WATERS: GENERAL CRITERIA;
 - C. 62-302.560 - CLASS III WATERS: RECREATION, PROPAGATION AND MAINTENANCE OF A HEALTHY, WELL BALANCED POPULATION OF FISH AND WILDLIFE;

THE PERMITTEE SHALL TAKE ALL MEASURES NECESSARY TO CONTROL TURBIDITY, INCLUDING BUT NOT LIMITED TO THE INSTALLATION OF TURBIDITY BARRIERS AT ALL LOCATIONS WHERE THE POSSIBILITY OF TRANSFERRING SUSPENDED SOLIDS INTO THE RECEIVING WATERBODY EXISTS DUE TO THE PROPOSED WORK. TURBIDITY BARRIERS MUST BE MAINTAINED IN EFFECTIVE CONDITION AT ALL LOCATIONS UNTIL CONSTRUCTION IS COMPLETED AND DISTURBED SOIL AREAS ARE STABILIZED. THEREAFTER, THE PERMITTEE MUST REMOVE THE BARRIERS. AT NO TIME SHALL THERE BE ANY OFF-SITE DISCHARGE WHICH VIOLATES THE STATE WATER QUALITY STANDARDS IN CHAPTER 62-302, FLORIDA ADMINISTRATIVE CODE.

20. SILT SCREENS, FLOATING TURBIDITY BOOMS AND/OR OTHER SUCH SEDIMENT CONTROL MEASURES SHALL BE UTILIZED DURING CONSTRUCTION. THE SELECTED SEDIMENT CONTROL MEASURES

SHALL BE INSTALLED AROUND THE SPOIL DISPOSAL SITE AND AT THE LIMITS OF PROJECT CONSTRUCTION IN ACCORDANCE WITH EXHIBITS 2A AND 3, RESPECTIVELY. INSTALLATION MAY BE INSPECTED BY THE DISTRICT'S ENVIRONMENTAL COMPLIANCE STAFF PRIOR TO THE COMMENCEMENT OF DREDGING ACTIVITIES. ALL CONTROL MEASURES SHALL BE INSPECTED ON A REGULAR BASIS BY THE PERMITTEE AND MAINTAINED IN GOOD CONDITION. SEDIMENT AND TURBIDITY CONTROLS SHALL REMAIN IN PLACE UNTIL PROJECT CONSTRUCTION HAS BEEN COMPLETED AND THE SITE HAS BEEN INSPECTED AND DETERMINED TO BE IN COMPLIANCE BY THE DISTRICT'S ENVIRONMENTAL COMPLIANCE STAFF.

21. ALL CONTRACTORS MUST BE PROVIDED WITH A COPY OF THE STAFF REPORT AND PERMIT CONDITIONS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
22. THE CONSTRUCTION OF THE ACCESS CHANNEL ON THE WESTERN SIDE OF THE ISLAND SHALL NOT COMMENCE UNTIL SUCH TIME AS THE PERMITTEE HAS RECEIVED A RECORDED COPY OF THE SOVEREIGN SUBMERGED LANDS EASEMENT GRANTED.
23. A WETLAND MONITORING PROGRAM SHALL BE IMPLEMENTED WITHIN THE PROTECTED MANGROVES AND SEAGRASS CREATION AREA. MONITORING SHALL BE CONDUCTED IN ACCORDANCE WITH EXHIBIT(S) 6 AND SHALL INCLUDE ANNUAL REPORTS SUBMITTED TO THE SFWMD FOR REVIEW. MONITORING SHALL CONTINUE FOR A PERIOD OF 5 YEARS.
24. THE PERMITTEE SHALL ENHANCE 3.0 ACRES OF MANGROVES AND CREATE 0.27 ACRES OF SEAGRASSES AS MITIGATION FOR 0.23 ACRES OF SEAGRASS IMPACTS.
25. EXHIBITS 9A AND 9B, "TIDAL HYDRODYNAMIC MODELING OF PEANUT ISLAND IMPROVEMENTS" AND "HYDRODYNAMIC MODELING OF PEANUT ISLAND IMPROVEMENTS," PREPARED BY TOMASELLO CONSULTING ENGINEERS, INC., FOR THE PALM BEACH BOARD OF COUNTY COMMISSIONERS AND FOR COASTAL SYSTEMS INTERNATIONAL, INC., ARE HEREBY INCORPORATED INTO THIS PERMIT BY REFERENCE. THE DATES OF THE DOCUMENTS ARE MAY, 1997 AND DECEMBER 1999.
26. DURING CONSTRUCTION OF THE TIDAL POND/BOAT BASIN, SHALLOW WATER LAGOONS, SHALLOW WATER REEF AND FLUSHING CHANNELS, ALL WORK SHALL BE CONDUCTED BEHIND EARTHEN BERMS (SEE EXHIBIT 3). THE EARTHEN BERMS SHALL REMAIN IN PLACE AFTER THE COMPLETION OF CONSTRUCTION UNTIL SUCH TIME AS THE TURBIDITY LEVELS IN THE CREATED SURFACE WATERS ARE WITHIN 29 N.T.U. OF THE RECEIVING WATERBODY. TURBIDITY CURTAINS SHALL BE UTILIZED DURING THE REMOVAL OF THE EARTHEN BERMS.
27. THE SEAGRASS MITIGATION AREA WILL ACHIEVE A TEN PERCENT (10%) COVERAGE OF SEAGRASS VEGETATION BY THE END OF THE THIRD YEAR OF MONITORING. SUBSEQUENT MONITORING SHALL DEMONSTRATE THE CONTINUING COVERAGE OF THIS AREA. IN THE EVENT THAT SUCCESSFUL SEAGRASS RECRUITMENT DOES NOT OCCUR BY THE END OF THE FIFTH YEAR OF MONITORING, PALM BEACH COUNTY SHALL BE RESPONSIBLE FOR PROVIDING ALTERNATIVE MITIGATION. THE ALTERNATIVE MITIGATION MUST BE REVIEWED AND APPROVED BY THE SFWMD. PALM BEACH COUNTY SHALL ALSO BE RESPONSIBLE FOR THE SUCCESSFUL ENHANCEMENT OF THE MANGROVE WETLANDS AND FOR MAINTAINING THE MANGROVE FLUSHING CHANNELS FREE OF ACCRETION OF SEDIMENTS.
28. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE PERMITTEE SHALL CONDUCT A PRE-CONSTRUCTION MEETING WITH FIELD REPRESENTATIVES, CONTRACTORS AND DISTRICT STAFF. THE PURPOSE OF THE MEETING WILL BE TO DISCUSS THE TYPE AND LOCATION OF TURBIDITY AND EROSION CONTROLS TO BE IMPLEMENTED DURING CONSTRUCTION AND THE MOBILIZATION AND STAGING OF CONTRACTOR EQUIPMENT.
29. DUE TO THE PROXIMITY OF THIS PROJECT TO AREAS OF KNOWN MANATEE CONCENTRATIONS, ALL WORK CONDUCTED WATERWARD OF THE EXISTING SHORELINE DURING THE MONTHS OF DECEMBER, JANUARY AND FEBRUARY SHALL BE SUBJECT TO THE FOLLOWING CONDITIONS:

A) THE BUREAU OF PROTECTED SPECIES MANAGEMENT SHALL BE NOTIFIED ONE WEEK PRIOR TO THE COMMENCEMENT OF THE WORK;

B) AT LEAST ONE PERSON SHALL BE DESIGNATED AS A MANATEE OBSERVER AT EACH SITE WHEN IN-WATER WORK IS BEING PERFORMED. THE MANATEE OBSERVER MUST BE ON SITE DURING ALL IN-WATER CONSTRUCTION ACTIVITIES AND WILL ADVISE PERSONNEL TO CEASE OPERATION UPON SIGHTING A MANATEE WITHIN 50 FEET OF ANY IN-WATER CONSTRUCTION ACTIVITY. MOVEMENT OF A WORK BARGE, OTHER ASSOCIATED VESSELS, OR ANY IN-WATER WORK SHALL NOT BE PERFORMED AFTER SUNSET, WHEN THE POSSIBILITY OF SPOTTING MANATEES IS NEGLIGIBLE; AND;

C) THE PERMITTEE SHALL ENSURE THAT THE CONTRACTOR MAINTAINS A LOG DETAILING SIGHTINGS, COLLISIONS, OR INJURIES TO MANATEES SHOULD THEY OCCUR DURING THE CONTRACT PERIOD. FOLLOWING PROJECT COMPLETION, THE LOGS SHALL BE SUBMITTED TO THE BUREAU OF PROTECTED SPECIES MANAGEMENT, 620 SOUTH MERIDIAN STREET, TALLAHASSEE, FLORIDA 32399-1600; AND;

30. THE MANATEE AWARENESS AND EDUCATION SIGNS SHALL BE INSTALLED AND MAINTAINED TO INCREASE BOATER AWARENESS. THESE SIGNS SHALL BE INSTALLED PRIOR TO THE FACILITY OPENING AND BEGINNING OPERATIONS, SHOULD BE REPLACED IN THE EVENT THE SIGNS FADE OR BECOME DAMAGED, AND SHALL BE MAINTAINED FOR THE LIFE OF THE FACILITY. THE NUMBER, TYPE, AND PROCEDURE FOR INSTALLATION SHOULD BE IN ACCORDANCE WITH "PERMANENT MANATEE SIGNS" WHICH CAN BE OBTAINED FROM THE BUREAU OF PROTECTED SPECIES MANAGEMENT, 620 S. MERIDIAN STREET, TALLAHASSEE, FL 32399-1600 (PHONE 850/922-4330).
31. A LITERATURE DISPLAY SHALL BE INSTALLED TO DISTRIBUTE (AT NO CHARGE) THE 'PALM BEACH COUNTY MANATEE PROTECTION ZONES' BOOKLETS TO BOATERS USING THE FACILITY. THE PERMITTEE SHALL ENSURE THAT THE LITERATURE DISPLAY HAS AN ADEQUATE SUPPLY OF BOOKLETS AT ALL TIMES.

GENERAL CONDITIONS

1. ALL ACTIVITIES AUTHORIZED BY THIS PERMIT SHALL BE IMPLEMENTED AS SET FORTH IN THE PLANS, SPECIFICATIONS AND PERFORMANCE CRITERIA AS APPROVED BY THIS PERMIT. ANY DEVIATION FROM THE PERMITTED ACTIVITY AND THE CONDITIONS FOR UNDERTAKING THAT ACTIVITY SHALL CONSTITUTE A VIOLATION OF THIS PERMIT AND PART IV, CHAPTER 373, F.S.
2. THIS PERMIT OR A COPY THEREOF, COMPLETE WITH ALL CONDITIONS, ATTACHMENTS, EXHIBITS, AND MODIFICATIONS SHALL BE KEPT AT THE WORK SITE OF THE PERMITTED ACTIVITY. THE COMPLETE PERMIT SHALL BE AVAILABLE FOR REVIEW AT THE WORK SITE UPON REQUEST BY THE DISTRICT STAFF. THE PERMITTEE SHALL REQUIRE THE CONTRACTOR TO REVIEW THE COMPLETE PERMIT PRIOR TO COMMENCEMENT OF THE ACTIVITY AUTHORIZED BY THIS PERMIT.
3. ACTIVITIES APPROVED BY THIS PERMIT SHALL BE CONDUCTED IN A MANNER WHICH DOES NOT CAUSE VIOLATIONS OF STATE WATER QUALITY STANDARDS. THE PERMITTEE SHALL IMPLEMENT BEST MANAGEMENT PRACTICES FOR EROSION AND POLLUTION CONTROL TO PREVENT VIOLATION OF STATE WATER QUALITY STANDARDS. TEMPORARY EROSION CONTROL SHALL BE IMPLEMENTED PRIOR TO AND DURING CONSTRUCTION, AND PERMANENT CONTROL MEASURES SHALL BE COMPLETED WITHIN 7 DAYS OF ANY CONSTRUCTION ACTIVITY. TURBIDITY BARRIERS SHALL BE INSTALLED AND MAINTAINED AT ALL LOCATIONS WHERE THE POSSIBILITY OF TRANSFERRING SUSPENDED SOLIDS INTO THE RECEIVING WATERBODY EXISTS DUE TO THE PERMITTED WORK. TURBIDITY BARRIERS SHALL REMAIN IN PLACE AT ALL LOCATIONS UNTIL CONSTRUCTION IS COMPLETED AND SOILS ARE STABILIZED AND VEGETATION HAS BEEN ESTABLISHED. ALL PRACTICES SHALL BE IN ACCORDANCE WITH THE GUIDELINES AND SPECIFICATIONS DESCRIBED IN CHAPTER 6 OF THE FLORIDA LAND DEVELOPMENT MANUAL; A GUIDE TO SOUND LAND AND WATER MANAGEMENT (DEPARTMENT OF ENVIRONMENTAL REGULATION, 1988), INCORPORATED BY REFERENCE IN RULE 40E-4.091, F.A.C. UNLESS A PROJECT-SPECIFIC EROSION AND SEDIMENT CONTROL PLAN IS APPROVED AS PART OF THE PERMIT. THEREAFTER THE PERMITTEE SHALL BE RESPONSIBLE FOR THE REMOVAL OF THE BARRIERS. THE PERMITTEE SHALL CORRECT ANY EROSION OR SHOALING THAT CAUSES ADVERSE IMPACTS TO THE WATER RESOURCES.
4. THE PERMITTEE SHALL NOTIFY THE DISTRICT OF THE ANTICIPATED CONSTRUCTION START DATE WITHIN 30 DAYS OF THE DATE THAT THIS PERMIT IS ISSUED. AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF ACTIVITY AUTHORIZED BY THIS PERMIT, THE PERMITTEE SHALL SUBMIT TO THE DISTRICT AN ENVIRONMENTAL RESOURCE PERMIT CONSTRUCTION COMMENCEMENT NOTICE FORM NO. 0960 INDICATING THE ACTUAL START DATE AND THE EXPECTED COMPLETION DATE.
5. WHEN THE DURATION OF CONSTRUCTION WILL EXCEED ONE YEAR, THE PERMITTEE SHALL SUBMIT CONSTRUCTION STATUS REPORTS TO THE DISTRICT ON AN ANNUAL BASIS UTILIZING AN ANNUAL STATUS REPORT FORM. STATUS REPORT FORMS SHALL BE SUBMITTED THE FOLLOWING JUNE OF EACH YEAR.
6. WITHIN 30 DAYS AFTER COMPLETION OF CONSTRUCTION OF THE PERMITTED ACTIVITY, THE PERMITTEE SHALL SUBMIT A WRITTEN STATEMENT OF COMPLETION AND CERTIFICATION BY A REGISTERED PROFESSIONAL ENGINEER OR OTHER APPROPRIATE INDIVIDUAL AS AUTHORIZED BY LAW, UTILIZING THE SUPPLIED ENVIRONMENTAL RESOURCE PERMIT CONSTRUCTION COMPLETION/CONSTRUCTION CERTIFICATION FORM NO.0881. THE STATEMENT OF COMPLETION AND CERTIFICATION SHALL BE BASED ON ONSITE OBSERVATION OF CONSTRUCTION OR REVIEW OF ASBUILT DRAWINGS FOR THE PURPOSE OF DETERMINING IF THE WORK WAS COMPLETED IN COMPLIANCE WITH PERMITTED PLANS AND SPECIFICATIONS. THIS SUBMITTAL SHALL SERVE TO NOTIFY THE DISTRICT THAT THE SYSTEM IS READY FOR INSPECTION. ADDITIONALLY, IF DEVIATION FROM THE APPROVED DRAWINGS ARE DISCOVERED DURING THE CERTIFICATION PROCESS, THE CERTIFICATION MUST BE ACCOMPANIED BY A COPY OF THE APPROVED PERMIT DRAWINGS WITH DEVIATIONS NOTED. BOTH THE ORIGINAL AND REVISED SPECIFICATIONS MUST BE CLEARLY SHOWN. THE PLANS MUST BE CLEARLY LABELED AS "ASBUILT" OR "RECORD" DRAWING. ALL SURVEYED DIMENSIONS AND ELEVATIONS SHALL BE CERTIFIED BY A

REGISTERED SURVEYOR.

7. THE OPERATION PHASE OF THIS PERMIT SHALL NOT BECOME EFFECTIVE: UNTIL THE PERMITTEE HAS COMPLIED WITH THE REQUIREMENTS OF CONDITION (6) ABOVE, HAS SUBMITTED A REQUEST FOR CONVERSION OF ENVIRONMENTAL RESOURCE PERMIT FROM CONSTRUCTION PHASE TO OPERATION PHASE, FORM NO.0920; THE DISTRICT DETERMINES THE SYSTEM TO BE IN COMPLIANCE WITH THE PERMITTED PLANS AND SPECIFICATIONS; AND THE ENTITY APPROVED BY THE DISTRICT IN ACCORDANCE WITH SECTIONS 9.0 AND 10.0 OF THE BASIS OF REVIEW FOR ENVIRONMENTAL RESOURCE PERMIT APPLICATIONS WITHIN THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT - AUGUST 1995, ACCEPTS RESPONSIBILITY FOR OPERATION AND MAINTENANCE OF THE SYSTEM. THE PERMIT SHALL NOT BE TRANSFERRED TO SUCH APPROVED OPERATION AND MAINTENANCE ENTITY UNTIL THE OPERATION PHASE OF THE PERMIT BECOMES EFFECTIVE. FOLLOWING INSPECTION AND APPROVAL OF THE PERMITTED SYSTEM BY THE DISTRICT, THE PERMITTEE SHALL INITIATE TRANSFER OF THE PERMIT TO THE APPROVED RESPONSIBLE OPERATING ENTITY IF DIFFERENT FROM THE PERMITTEE. UNTIL THE PERMIT IS TRANSFERRED PURSUANT TO SECTION 40E-1.6107, F.A.C., THE PERMITTEE SHALL BE LIABLE FOR COMPLIANCE WITH THE TERMS OF THE PERMIT.
8. EACH PHASE OR INDEPENDENT PORTION OF THE PERMITTED SYSTEM MUST BE COMPLETED IN ACCORDANCE WITH THE PERMITTED PLANS AND PERMIT CONDITIONS PRIOR TO THE INITIATION OF THE PERMITTED USE OF SITE INFRASTRUCTURE LOCATED WITHIN THE AREA SERVED BY THAT PORTION OR PHASE OF THE SYSTEM. EACH PHASE OR INDEPENDENT PORTION OF THE SYSTEM MUST BE COMPLETED IN ACCORDANCE WITH THE PERMITTED PLANS AND PERMIT CONDITIONS PRIOR TO TRANSFER OF RESPONSIBILITY FOR OPERATION AND MAINTENANCE OF THE PHASE OR PORTION OF THE SYSTEM TO A LOCAL GOVERNMENT OR OTHER RESPONSIBLE ENTITY.
9. FOR THOSE SYSTEMS THAT WILL BE OPERATED OR MAINTAINED BY AN ENTITY THAT WILL REQUIRE AN EASEMENT OR DEED RESTRICTION IN ORDER TO ENABLE THAT ENTITY TO OPERATE OR MAINTAIN THE SYSTEM IN CONFORMANCE WITH THIS PERMIT, SUCH EASEMENT OR DEED RESTRICTION MUST BE RECORDED IN THE PUBLIC RECORDS AND SUBMITTED TO THE DISTRICT ALONG WITH ANY OTHER FINAL OPERATION AND MAINTENANCE DOCUMENTS REQUIRED BY SECTIONS 9.0 AND 10.0 OF THE BASIS OF REVIEW FOR ENVIRONMENTAL RESOURCE PERMIT APPLICATIONS WITHIN THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT - AUGUST 1995, PRIOR TO LOT OR UNIT SALES OR PRIOR TO THE COMPLETION OF THE SYSTEM, WHICHEVER OCCURS FIRST. OTHER DOCUMENTS CONCERNING THE ESTABLISHMENT AND AUTHORITY OF THE OPERATING ENTITY MUST BE FILED WITH THE SECRETARY OF STATE WHERE APPROPRIATE. FOR THOSE SYSTEMS WHICH ARE PROPOSED TO BE MAINTAINED BY THE COUNTY OR MUNICIPAL ENTITIES, FINAL OPERATION AND MAINTENANCE DOCUMENTS MUST BE RECEIVED BY THE DISTRICT WHEN MAINTENANCE AND OPERATION OF THE SYSTEM IS ACCEPTED BY THE LOCAL GOVERNMENT ENTITY. FAILURE TO SUBMIT THE APPROPRIATE FINAL DOCUMENTS WILL RESULT IN THE PERMITTEE REMAINING LIABLE FOR CARRYING OUT MAINTENANCE AND OPERATION OF THE PERMITTED SYSTEM AND ANY OTHER PERMIT CONDITIONS.
10. SHOULD ANY OTHER REGULATORY AGENCY REQUIRE CHANGES TO THE PERMITTED SYSTEM, THE PERMITTEE SHALL NOTIFY THE DISTRICT IN WRITING OF THE CHANGES PRIOR TO IMPLEMENTATION SO THAT A DETERMINATION CAN BE MADE WHETHER A PERMIT MODIFICATION IS REQUIRED.
11. THIS PERMIT DOES NOT ELIMINATE THE NECESSITY TO OBTAIN ANY REQUIRED FEDERAL, STATE, LOCAL AND SPECIAL DISTRICT AUTHORIZATIONS PRIOR TO THE START OF ANY ACTIVITY APPROVED BY THIS PERMIT. THIS PERMIT DOES NOT CONVEY TO THE PERMITTEE OR CREATE IN THE PERMITTEE ANY PROPERTY RIGHT, OR ANY INTEREST IN REAL PROPERTY, NOR DOES IT AUTHORIZE ANY ENTRANCE UPON OR ACTIVITIES ON PROPERTY WHICH IS NOT OWNED OR CONTROLLED BY THE PERMITTEE, OR CONVEY ANY RIGHTS OR PRIVILEGES OTHER THAN THOSE SPECIFIED IN THE PERMIT AND CHAPTER 40E-4 OR CHAPTER 40E-40, F.A.C.
12. THE PERMITTEE IS HEREBY ADVISED THAT SECTION 253.77, F.S. STATES THAT A PERSON MAY NOT COMMENCE ANY EXCAVATION, CONSTRUCTION, OR OTHER ACTIVITY INVOLVING THE USE OF SOVEREIGN OR OTHER LANDS OF THE STATE, THE TITLE TO WHICH IS VESTED IN THE BOARD

Dock Construction Guidelines in Florida
U.S. Army Corps of Engineers/National Marine Fisheries Service
November 1998

1. Avoidance. The pier shall be aligned so as to minimize the size of the footprint over seagrass beds.
2. Height of pier shall be a minimum of 5' above MHW as measured from the top surface of the decking.
3. Width of the pier shall be no more than a maximum of 4'. A turnaround area is allowed for piers greater than 200' in length. The turnaround is limited to a section of the pier no more than 10' in length and no more than 6' in width. The turnaround shall be located at the midpoint of the pier.
4. Over seagrass bed portions of the pier shall be oriented in a north-south orientation to the maximum extent that is practicable.
5. a. If possible, terminal platforms shall be placed in deep water waterward of seagrass beds or in an area devoid of seagrass beds.

b. If a terminal platform must be placed in seagrass areas, the total size of the platform shall be limited to 160 sq. ft. and be constructed of grated decking. The grated deck material must be approved by the Corps. The configuration of the platform shall be a maximum of 8' by 20', of which a maximum 5' wide by a maximum 20' long section shall conform to the 5' height requirement. A narrow 3' section may be placed 3' above MHW to facilitate boat access. The long axis of the platform should be aligned in a north-south direction to the maximum extent that is practicable.

c. If the terminal platform is to be constructed of planks, the total size of the platform shall be limited to 120 sq. ft. The configuration of the platform shall be a maximum of 6' by 20' of which a maximum 4' wide by 20' long section shall conform to the 5' height requirement. A narrow 2' section may be placed 3' above MHW to facilitate boat access. The 2' section shall be cantilevered. The long axis of the platform should be aligned in a north-south direction to the maximum extent that is practicable.
6. One uncovered boat slip is allowed. A narrow catwalk (2' wide) may be added to facilitate boat maintenance along the outboard side of the boat slip and a 4' wide walkway may be added along the stern end of the boat slip, provided all such walkways are elevated 5' above MHW. The 2' wide catwalk shall be cantilevered from the outboard mooring pilings (spaced no closer than 10' apart).
7. Pilings shall be installed in a manner which will not result in the formation of sedimentary deposits ("donuts" or "halos") around the newly installed pilings.
8. The spacing of pilings through seagrass beds shall be a minimum of 10'.
9. Gaps between deck boards shall be a minimum of 1/2".



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
WEST PALM BEACH REGULATORY OFFICE
400 NORTH CONGRESS AVENUE, SUITE 130
WEST PALM BEACH, FLORIDA 33401

APR 12 2002

Regulatory Division
South Permits Branch
199603357 (GP-BP)

Palm Beach County
Department of Environmental Resources Management
ATTN: Mr. Richard Walesky, Director
3323 Belvedere Road, Bldg 502
West Palm Beach, Florida 33406

Dear Applicant:

Reference is made to your joint permit application dated April 2, 2002 regarding the proposed floating dock to be constructed within a boat basin created from uplands on Peanut Island. The project is located within Section 34, Township 42 South, Range 43 East, Palm Beach County, Florida.


The proposed commercial dock construction is authorized by General Permit **SAJ-34**, a copy of which is enclosed for your information and use. You are authorized to proceed with the project in accordance with the enclosed drawings subject to ALL conditions of the permit.

If the work authorized herein is not completed by **March 01, 2007**, no further work may be undertaken and you should contact this office. A determination of the status of the General Permit will be made and you will be advised. If the General Permit has been reissued with no substantive change(s), a request for an extension of your previous authorization will be considered. If the General Permit has not been reissued or was reissued with new conditions, a new application and drawings may need to be submitted for further review.

Thank you for your cooperation with our permit program.

Sincerely,



 John F. Studt
Chief, South Permits Branch

Enclosure

REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4878
JACKSONVILLE, FLORIDA 32232-0010

Regulatory Division
Regional General Permit SAJ-34

MAR 01 2001

DEPARTMENT OF THE ARMY PERMIT

GENERAL PERMIT SAJ-34

COMMERCIAL PIERS - STATE OF FLORIDA

Upon recommendation of the Chief of Engineers, pursuant to Section 10 of the Rivers and Harbors Act of 3 March 1899 (33 U.S.C. 403), general authority is hereby given to construct commercial piers 1,000 square feet or less in surface area in navigable waters of the United States within the State of Florida subject to the following conditions:

SPECIAL CONDITIONS:

1. Structures authorized under this general permit are private commercial piers 1,000 square feet or less in surface area and accommodating 5 or fewer slips (including dry storage), unless a Florida Department of Environmental Protection-approved Manatee Protection Plan is more restrictive. This would include normal appurtenances such as boat hoists, boat shelters with open sides, stairways, walkways, mooring pilings, and maintenance of same. Associated mooring pilings are not included in this surface area. Note: Expansion of existing marinas or other commercial facilities is not authorized under this general permit.

2. No work shall be performed until the applicant submits satisfactory plans for the proposed structure and receives written authorization from the District Engineer.

3. No structures shall be authorized by the general permit in:

a. Federal Manatee Sanctuaries, refuges, motorboat prohibited zones, or no entry zones.

b. Crystal, Salt, and Homosassa Rivers, Citrus County, Doctors Lake and that portion of the St. Johns River from Green Cove Springs up to the Buckman Bridge (Clay County); Tomoka River (Volusia County); Caloosahatchee River in all areas adjacent to Cape

Coral (Lee County); Charlotte Harbor (Charlotte County); North Fork of the St. Lucie River (Martin County); Barnes Sound Waterway (Dade County).

c. Faka Union Canal in Collier County.

d. All waters of Brevard County except land-locked lakes.

e. Within 2 miles of the following manatee aggregation sites: FPC Crystal River Power Plant (Citrus County), FPC Bartow Power Plant (Pinellas County), TECO Big Bend Power Plant (Hillsborough County), TECO Port Sutton (Pinellas County), FPL Ft. Myers Power Plant (Lee County), Blue Springs (Volusia County), JEA Southside and JEA Kennedy Generating Stations and Jefferson Smurfit Corporation (Duval County), Container Corporation of America Paper Mill (Nassau County), Vero Beach Power Plant (Indian River County), Henry D. King Municipal Electric Station (Ft. Pierce, St. Lucie County), FPL Riviera Beach Power Plant (Palm Beach County), FPL Port Everglades Power Plant (Broward County), and FPL Lauderdale Power Plant (Broward County).

f. The Okeechobee Waterway between St. Lucie Lock in Martin County and W.P. Franklin Lock in Lee County.

g. American Crocodile critical habitat, Biscayne Bay National Park Protection Zone (Dade County), Lake Okeechobee or in the St. Lucie Impoundment (Palm Beach County), and areas identified in the Wild and Scenic Rivers Act (16 U.S.C. 1317, et seq.): the St. Mary's River, from its headwaters to its confluence with the Bells River, the entire Wekiva River, including Wekiwa Springs Run, Rock Springs Run, the entire Seminole Creek, and Black Water Creek from its outfall at Lake Norris to its confluence with the Wekiva River, the Loxahatchee River from Riverbend Park downstream to Jonathan Dickinson State Park.

h. Within the boundaries of the Timucuan Ecological and Historical Preserve (Duval County).

i. The following state parks in Monroe County: John Pennekamp Coral Reef State Park, Lignum Vitae Key State Botanical Site and Aquatic Preserve, Long Key State Park, Curry Hammock State Park, and Bahia Honda State Park.

4. No activity shall be authorized under this general permit which by its size or location may adversely affect water quality, fish and wildlife habitat, wetlands, or emergent or submerged

aquatic vegetation. Adverse impacts to submerged aquatic vegetation may be ameliorated by strict adherence to the attached joint U.S. Army Corps of Engineers'/National Marine Fisheries Service's "Dock Construction Guidelines", dated November 1998. Dock construction in submerged aquatic vegetation which does not adhere to these guidelines cannot be authorized by SAJ-34.

5. Prior to issuance of authorization the dichotomous key entitled, "Guidance to the Corps of Engineers, Jacksonville District, and the Department of Environmental Protection regarding 'may affect' determinations for the manatee in Florida", will be used to determine potential manatee impacts. Projects judged as a "may affect" to the manatee will be coordinated with the U.S. Fish and Wildlife Service in accordance with the Endangered Species Act. *Note: The manatee key may be subject to revision at any time. It is our intention that the most recent version of this technical tool will be utilized during the evaluation of the permit application.*

6. The permittee shall instruct all personnel associated with the project of the potential presence of manatees and the need to avoid collisions with manatees. All construction personnel are responsible for observing water-related activities for the presence of manatee(s).

7. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and the Florida Manatee Sanctuary Act of 1978. The permittee and/or contractor may be held responsible for any manatee harmed, harassed, or killed as a result of construction activities.

8. Siltation barriers shall be installed, shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be monitored regularly to avoid manatee entrapment. Barriers shall not block manatee entry to or exit from essential habitat.

9. All vessels associated with the project shall operate at "no wake/idle" speeds at all times while in water where the draft of the vessel provides less than four feet clearance from the bottom and that vessels shall follow routes of deep water whenever possible.

10. If a manatee is sighted within 100 yards of the project area, all appropriate precautions shall be implemented by the permittee/contractor to ensure protection of the manatee. These

precautions shall include operating all equipment in such a manner that moving equipment does not come within 50 feet to any manatee. Operation of any equipment closer than 50 feet to a manatee shall necessitate immediate shutdown of that equipment. Activities will not resume until the manatee(s) has departed the project area of its own volition.

11. Any collision with and/or injury to a manatee shall be reported immediately to the "Manatee Hotline" at 1-888-404-FWCC (1-888-404-3922). Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-232-2580) for north Florida or Vero Beach (1-561-562-3909) in south Florida.

12. Temporary signs concerning manatees shall be posted prior to and during construction/dredging activities. All temporary signs are to be removed by the permittee/contractor/lessee/grantee upon completion of the project. A sign measuring at least 3 feet by 4 feet which reads *Caution: Manatee Area* will be posted in a location prominently visible to water related construction crews. A second sign should be posted if vessels are associated with the construction, and should be placed visible to the vessel operator. The second sign should be at least 8 1/2 inches by 11 inches which reads:

Caution: Manatee Habitat. Idle speed is required if operating a vessel in the construction area. All equipment must be shutdown if a manatee comes within 50 feet of the operation. A collision with and/or injury to a manatee shall be reported immediately to the Florida Marine Patrol at 1-888-404-FWCC (1-888-404-3922) and the U.S. Fish and Wildlife Service at (1-904-232-2580) for north Florida or (1-561-562-3909) for south Florida.

13. One permanent manatee awareness sign (s) shall be installed and maintained at the docking facility. The sign shall be three feet by four feet, 125 gauge 61TS aluminum, covered with white, engineer grade, reflective sheeting; black, painted lettering; black screened design; and orange, engineer grade, reflective tape border. The 3 feet wide by 4 feet long sign shall conform to the Florida Uniform Waterway Marking System in accordance with F.S. 327.40-1. The installation of the sign shall be made in accordance with DEP specification for such signs.

14. Verification (photos) that signs have been installed at designated locations shall be provided to the U.S. Fish and

Wildlife Service and the Corps before the docking facility begins operations. Signs and pilings remain the responsibility of the owner(s) and are to be maintained for the life of the docking facility in a manner acceptable to the Corps of Engineers.

15. Where multiple slip facilities are authorized, the dock must be grouped to minimize shoreline disruption.

16. In the Intracoastal Waterway, no structure, including mooring piles, authorized under this general permit shall be within the established setback (normally 100' but may vary in a few specific reaches), calculated from the near-bottom edge of the Federal channel, unless it is a 5-foot marginal pier. Any activity within Federal rights-of-way will require the permittee to enter into a consent-to-easement with the Real Estate Division, U.S. Army Corps of Engineers, Jacksonville or Mobile District, as appropriate, prior to the commencement of any construction activity.

17. No living, fueling, or storage facilities over navigable waters of the United States are authorized under this general permit.

18. The structure shall not adversely affect or disturb properties listed or eligible for inclusion in the National Register of Historic Places. Prior to the start of work, the permittee must contact the State Historic Preservation Officer in Tallahassee and receive confirmation that no impacts to cultural resources will occur.

19. Applicable permits under part IV of chapter 373 of the Florida Statutes, and applicable state lands authorizations under chapter 253 of the Florida Statutes must be obtained from the State of Florida, Department of Environmental Protection (DEP), or Water Management District (WMD), or their authorized representatives, as appropriate.

20. A structure authorized by this general permit must not interfere with general navigation. Structures constructed on canals or adjacent to channels must not extend more than 25% of waterway width.

21. No work shall be performed until after the permittee provides notification to the owner(s) or operator(s) of any marked utilities in the area of the structure.

22. This general permit will be valid until suspended or revoked by issuance of a public notice by the District Engineer.

Reviews will be conducted to determine if continuance of the permit is not contrary to the public interest.

23. Conformance with the description contained herein does not necessarily guarantee authorization under this general permit.

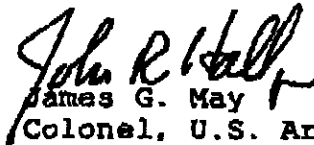
24. The District Engineer reserves the right to require that any request for authorization under this general permit be processed as a standard permit.

25. This general permit shall be valid for a period of five (5) years from the date issued. Authorization of activities that have commenced or are under contract to commence in reliance on SAJ-34 will remain in effect provided the activity is completed within twelve months of the date SAJ-34 expired or was revoked.

26. No activity shall be authorized under this general permit which is likely to adversely affect a Federally listed threatened or endangered species or a species proposed for such designation, or destroy or adversely modify its designated critical habitat.

27. The General Conditions attached hereto are made a part of this permit

BY AUTHORITY OF THE SECRETARY OF THE ARMY:


James G. May
Colonel, U.S. Army
District Engineer

GENERAL CONDITIONS FOR DEPARTMENT OF THE ARMY PERMITS**General Conditions**

1. The time limit for completing the work authorized ends on _____.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit, you must obtain the signature and mailing address of the new owner in the space provided below and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.
7. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structures or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

Further Information:

1. Limits of this authorization.
 - a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.
 - b. This permit does not grant any property rights or exclusive privileges.
 - c. This permit does not authorize any injury to the property or rights of others.
 - d. This permit does not authorize interference with any existing or proposed Federal projects.
2. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:
 - a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

3. **Reliance on Applicant's Data:** The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

4. **Reevaluation of Permit Decision:** This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 3 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

5. Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFeree-SIGNATURE)

(DATE)

(NAME-PRINTED)

(ADDRESS)

Dock Construction Guidelines in Florida
U.S. Army Corps of Engineers/National Marine Fisheries Service
November 1998

1. Avoidance. The pier shall be aligned so as to minimize the size of the footprint over seagrass beds.
2. Height of pier shall be a minimum of 5' above MHW as measured from the top surface of the decking.
3. Width of the pier shall be no more than a maximum of 4'. A turnaround area is allowed for piers greater than 200' in length. The turnaround is limited to a section of the pier no more than 10' in length and no more than 6' in width. The turnaround shall be located at the midpoint of the pier.
4. Over seagrass bed portions of the pier shall be oriented in a north-south orientation to the maximum extent that is practicable.
5. a. If possible, terminal platforms shall be placed in deep water waterward of seagrass beds or in an area devoid of seagrass beds.

b. If a terminal platform must be placed in seagrass areas, the total size of the platform shall be limited to 160 sq. ft. and be constructed of grated decking. The grated deck material must be approved by the Corps. The configuration of the platform shall be a maximum of 8' by 20', of which a maximum 5' wide by a maximum 20' long section shall conform to the 5' height requirement. A narrow 3' section may be placed 3' above MHW to facilitate boat access. The long axis of the platform should be aligned in a north-south direction to the maximum extent that is practicable.

c. If the terminal platform is to be constructed of planks, the total size of the platform shall be limited to 120 sq. ft. The configuration of the platform shall be a maximum of 6' by 20' of which a maximum 4' wide by 20' long section shall conform to the 5' height requirement. A narrow 2' section may be placed 3' above MHW to facilitate boat access. The 2' section shall be cantilevered. The long axis of the platform should be aligned in a north-south direction to the maximum extent that is practicable.
6. One uncovered boat slip is allowed. A narrow catwalk (2' wide) may be added to facilitate boat maintenance along the outboard side of the boat slip and a 4' wide walkway may be added along the stern end of the boat slip, provided all such walkways are elevated 5' above MHW. The 2' wide catwalk shall be cantilevered from the outboard mooring pilings (spaced no closer than 10' apart).
7. Pilings shall be installed in a manner which will not result in the formation of sedimentary deposits ("donuts" or "halos") around the newly installed pilings.
8. The spacing of pilings through seagrass beds shall be a minimum of 10'.
9. Gaps between deck boards shall be a minimum of 1/2".



FORM 9914B
Rev. 02/95

Lake Worth Lagoon

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE PERMIT NO. 50-04766-P
DATE ISSUED: FEBRUARY 15, 2001

PERMITTEE: CITY OF LAKE WORTH
(CITY OF LAKE WORTH RESTORATION PROJECT)
7 NORTH DIXIE HIGHWAY,
LAKE WORTH, FL 33460

PROJECT DESCRIPTION: AUTHORIZATION FOR CONSTRUCTION OF AN ENVIRONMENTAL RESTORATION PROJECT WITHIN 99 ACRES OF LAKE WORTH LAGOON IN PALM BEACH COUNTY INCLUDING 0.4 ACRE EXPANSION OF GOLF COURSE TEES.

PROJECT LOCATION: PALM BEACH COUNTY, SECTION 15.22 TWP 44S RGE 43E

PERMIT DURATION: Five years from the date issued to complete construction of the surface water management system as authorized herein. See attached Rule 40E-4.321, Florida Administrative Code.

This Permit is issued pursuant to Application No. 000525-7, dated May 24, 2000. Permittee agrees to hold and save the South Florida Water Management District and its successors harmless from any and all damages, claims or liabilities which may arise by reason of the construction, operation, maintenance or use of activities authorized by this Permit. This Permit is issued under the provisions of Chapter 373, Part IV Florida Statutes (F.S.), and the Operating Agreement Concerning Regulation Under Part IV, Chapter 373 F.S., between South Florida Water Management District and the Department of Environmental Protection. Issuance of this Permit constitutes certification of compliance with state water quality standards where necessary pursuant to Section 401, Public Law 92-500, 33 USC Section 1341, unless this Permit is issued pursuant to the net improvement provisions of Subsections 373.414(1)(b), F.S., or as otherwise stated herein.

This Permit may be transferred pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-1.6107(1) and (2), and 40E-4.351(1), (2), and (4), Florida Administrative Code (F.A.C.). This Permit may be revoked, suspended, or modified at any time pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-4.351(1), (2), and (4), F.A.C.

This Permit shall be subject to the General Conditions set forth in Rule 40E-4.381, F.A.C., unless waived or modified by the Governing Board. The Application, and the Environmental Resource Permit Staff Review Summary of the Application, including all conditions, and all plans and specifications incorporated by reference, are a part of this Permit. All activities authorized by this Permit shall be implemented as set forth in the plans, specifications, and performance criteria as set forth and incorporated in the Environmental Resource Permit Staff Review Summary. Within 30 days after completion of construction of the permitted activity, the Permittee shall submit a written statement of completion and certification by a registered professional engineer or other appropriate individual, pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-4.361 and 40E-4.381, F.A.C.

In the event the property is sold or otherwise conveyed, the Permittee will remain liable for compliance with this Permit until transfer is approved by the District pursuant to Rule 40E-1.6107, F.A.C.

SPECIAL AND GENERAL CONDITIONS ARE AS FOLLOWS:

SEE PAGES	2 - 3	OF 6	(11 SPECIAL CONDITIONS).
SEE PAGES	4 - 6	OF 6	(19 GENERAL CONDITIONS).

FILED WITH THE CLERK OF THE SOUTH
FLORIDA WATER MANAGEMENT DISTRICT

SOUTH FLORIDA WATER MANAGEMENT
DISTRICT, BY ITS GOVERNING BOARD

ON 28-Feb-2001

BY Jennifer Krumlauf
DEPUTY CLERK

By [Signature]
ASSISTANT SECRETARY

Lake Worth Lagoon



FORM 2014S
Rev. 06/95

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE PERMIT NO. 50-04766-P
DATE ISSUED: FEBRUARY 15, 2001

PERMITTEE: CITY OF LAKE WORTH
(CITY OF LAKE WORTH RESTORATION PROJECT)
7 NORTH DIXIE HIGHWAY,
LAKE WORTH, FL 33460

PROJECT DESCRIPTION: AUTHORIZATION FOR CONSTRUCTION OF AN ENVIRONMENTAL RESTORATION PROJECT WITHIN 99 ACRES OF LAKE WORTH LAGOON IN PALM BEACH COUNTY INCLUDING 0.4 ACRE EXPANSION OF GOLF COURSE TEES.

PROJECT LOCATION: PALM BEACH COUNTY, SECTION 15.22 TWP 44S RGE 43E

PERMIT DURATION: Five years from the date issued to complete construction of the surface water management system as authorized herein. See attached Rule 40E-4.321, Florida Administrative Code.

This Permit is issued pursuant to Application No. 000525-7, dated May 24, 2000. Permittee agrees to hold and save the South Florida Water Management District and its successors harmless from any and all damages, claims or liabilities which may arise by reason of the construction, operation, maintenance or use of activities authorized by this Permit. This Permit is issued under the provisions of Chapter 373, Part IV Florida Statutes (F.S.), and the Operating Agreement Concerning Regulation Under Part IV, Chapter 373 F.S., between South Florida Water Management District and the Department of Environmental Protection. Issuance of this Permit constitutes certification of compliance with state water quality standards where necessary pursuant to Section 401, Public Law 92-500, 33 USC Section 1341, unless this Permit is issued pursuant to the net improvement provisions of Subsections 373.414(1)(b), F.S., or as otherwise stated herein. PBC ①

This Permit may be transferred pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-1.6107(1) and (2), and 40E-4.351(1), (2), and (4), Florida Administrative Code (F.A.C.). This Permit may be revoked, suspended, or modified at any time pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-4.351(1), (2), and (4), F.A.C.

⑦ This Permit shall be subject to the General Conditions set forth in Rule 40E-4.381, F.A.C., unless waived or modified by the Governing Board. The Application, and the Environmental Resource Permit Staff Review Summary of the Application, including all conditions, and all plans and specifications incorporated by reference, are a part of this Permit. All activities authorized by this Permit shall be implemented as set forth in the plans, specifications, and performance criteria as set forth and incorporated in the Environmental Resource Permit Staff Review Summary. Within 30 days after completion of construction of the permitted activity, the Permittee shall submit a written statement of completion and certification by a registered professional engineer or other appropriate individual, pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-4.361 and 40E-4.381, F.A.C.

In the event the property is sold or otherwise conveyed, the Permittee will remain liable for compliance with this Permit until transfer is approved by the District pursuant to Rule 40E-1.6107, F.A.C.

SPECIAL AND GENERAL CONDITIONS ARE AS FOLLOWS:

SEE PAGES	2 - 3	OF 6	(11 SPECIAL CONDITIONS).
SEE PAGES	4 - 6	OF 6	(19 GENERAL CONDITIONS).

FILED WITH THE CLERK OF THE SOUTH
FLORIDA WATER MANAGEMENT DISTRICT

SOUTH FLORIDA WATER MANAGEMENT
DISTRICT, BY ITS GOVERNING BOARD

ON 28-Feb-2001

BY Jennifer Krumlauf
DEPUTY CLERK

By [Signature]
ASSISTANT SECRETARY

SPECIAL CONDITIONS

1. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION, SHOALING OR WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.
2. MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.
3. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT ADDITIONAL WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY. (2)
4. FACILITIES OTHER THAN THOSE STATED HEREIN SHALL NOT BE CONSTRUCTED WITHOUT AN APPROVED MODIFICATION OF THIS PERMIT. (4)
5. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF THE PERMITTEE. PRIOR TO TRANSFER OF TITLE FOR ANY PORTION OF THE PROJECT TO A THIRD PARTY, MODIFICATION OF THE PERMIT WILL BE REQUIRED.
6. ACTIVITIES ASSOCIATED WITH IMPLEMENTATION OF THE WETLAND MITIGATION, MONITORING AND MAINTENANCE SHALL BE IN ACCORDANCE WITH THE FOLLOWING WORK SCHEDULE. ANY DEVIATION FROM THESE TIME FRAMES SHALL REQUIRE FORMAL SFWMD APPROVAL. SUCH REQUESTS MUST BE MADE IN WRITING AND SHALL INCLUDE (1) REASON FOR THE MODIFICATION; (2) PROPOSED START/FINISH DATES; AND (3) PROGRESS REPORT ON THE STATUS OF THE EXISTING MITIGATION EFFORTS.

COMPLETION DATE	ACTIVITY
OCTOBER 15, 2002	FIRST MONITORING REPORT
OCTOBER 15, 2003	SECOND MONITORING REPORT
OCTOBER 15, 2004	THIRD MONITORING REPORT
OCTOBER 15, 2005	FOURTH MONITORING REPORT
OCTOBER 15, 2006	FIFTH MONITORING REPORT

7. THE PERMITTEE SHALL COMPLY WITH THE FOLLOWING MANATEE PROTECTION CONSTRUCTION CONDITIONS:
 - A) THE PERMITTEE SHALL INSTRUCT ALL PERSONNEL ASSOCIATED WITH THE PROJECT OF THE POTENTIAL PRESENCE OF MANATEES AND THE NEED TO AVOID COLLISION WITH MANATEES. ALL CONSTRUCTION PERSONNEL ARE RESPONSIBLE FOR OBSERVING WATER-RELATED ACTIVITIES FOR THE PRESENCE OF MANATEE(S).
 - B) THE PERMITTEE SHALL ADVISE ALL CONSTRUCTION PERSONNEL THAT THERE ARE CIVIL AND CRIMINAL PENALTIES FOR HARMING, HARASSING, OR KILLING MANATEES WHICH ARE PROTECTED UNDER THE MARINE MAMMAL PROTECTION ACT OF 1972, THE ENDANGERED SPECIES ACT OF 1973, AND THE FLORIDA MANATEE SANCTUARY ACT.
 - C) SILTATION BARRIERS SHALL BE MADE OF MATERIAL IN WHICH MANATEES CANNOT BECOME ENTANGLED, ARE PROPERLY SECURED, AND ARE REGULARLY MONITORED TO AVOID MANATEE ENTRAPMENT. BARRIERS MUST NOT BLOCK MANATEE ENTRY TO OR EXIT FROM ESSENTIAL HABITAT.
 - D) ALL VESSELS ASSOCIATED WITH THE CONSTRUCTION PROJECT SHALL OPERATE AT "NO WAKE/IDLE" SPEEDS AT ALL TIMES WHILE IN THE CONSTRUCTION AREA AND WHILE IN WATER WHERE THE DRAFT OF THE VESSEL PROVIDES LESS THAN FOUR-FEET CLEARANCE FROM THE BOTTOM. ALL VESSELS WILL FOLLOW ROUTES OF DEEP WATER WHENEVER POSSIBLE.
 - E) IF MANATEES OR SEA TURTLE SEEN WITHIN 100 YARDS OF THE ACTIVE DAILY

CONSTRUCTION/DREDGING OPERATION OR VESSEL MOVEMENT, ALL APPROPRIATE PRECAUTIONS SHALL BE IMPLEMENTED TO ENSURE PROTECTION OF THE MANATEE OR SEA TURTLE. THESE PRECAUTIONS SHALL INCLUDE THE OPERATION OF ALL MOVING EQUIPMENT NO CLOSER THAN 50 FEET OF A MANATEE OR SEA TURTLE. OPERATION OF ANY EQUIPMENT CLOSER THAN 50 FEET TO A MANATEE OR SEA TURTLE SHALL NECESSITATE IMMEDIATE SHUTDOWN OF THAT EQUIPMENT. ACTIVITIES WILL NOT RESUME UNTIL THE MANATEE OR SEA TURTLE HAS DEPARTED THE PROJECT AREA OF ITS OWN VOLITION.

F) ANY COLLISION WITH AND/OR INJURY TO A MANATEE SHALL BE REPORTED IMMEDIATELY TO THE FLORIDA MARINE PATROL AT 1-800-DIAL-FMP (1-800-342 5367). COLLISION AND/OR INJURY SHOULD ALSO BE REPORTED TO THE U.S. FISH AND WILDLIFE SERVICE IN VERO BEACH (1-407-562-3909).

G) TEMPORARY SIGNS CONCERNING MANATEES SHALL BE POSTED PRIOR TO AND DURING ALL CONSTRUCTION/DREDGING ACTIVITIES. ALL SIGNS ARE TO BE REMOVED BY THE PERMITTEE UPON COMPLETION OF THE PROJECT. A SIGN MEASURING AT LEAST THREE (3) FEET BY FOUR (4) FEET WHICH READS "CAUTION: MANATEE AREA" WILL BE POSTED IN A LOCATION PROMINENTLY VISIBLE TO WATER RELATED CONSTRUCTION CREWS. A SECOND SIGN SHOULD BE POSTED IF VESSELS ARE ASSOCIATED WITH THE CONSTRUCTION, AND SHOULD BE PLACED VISIBLE TO THE VESSEL OPERATOR. THE SECOND SIGN SHOULD BE AT LEAST 8 1/2 INCHES BY 11 INCHES AND SHOULD READ "CAUTION: MANATEE HABITAT". IDLE SPEED IS REQUIRED IF OPERATING A VESSEL IN THE CONSTRUCTION AREA. ALL EQUIPMENT MUST BE SHUTDOWN IF A MANATEE COMES WITHIN 50 FEET OF OPERATION. ANY COLLISION WITH AND/OR INJURY TO A MANATEE SHALL BE REPORTED IMMEDIATELY TO THE FLORIDA MARINE PATROL AT 1-800-DIAL-FMP (1-800-342-5367). THE U.S. FISH AND WILDLIFE SERVICE SHOULD ALSO BE CONTACTED IN VERO BEACH (1-407-562-3909)."

8. PALM BEACH COUNTY SHALL BE RESPONSIBLE FOR SUCCESSFUL COMLETION OF THE MITIGATION PLAN (EXHIBIT 8). SEAGRASS MITIGATION IS SUCCESSFUL WHEN 3.35 ACRES OF SEAGRASS OF AT LEAST 30% DENSITY PER SQUARE METER, PERSIST FOR TWO OF THE FIVE ANNUAL MONITORING REPORTS. IN ANY CASE, MONITORING SHALL CONTINUE FOR A MINIMUM OF FIVE YEARS OR UNTIL TWO YEARS SUCCESS ARE ACHEIVED, WHICHEVER IS GREATER.
9. A POST CONSTRUCTION MANGROVE SURVEY SHALL BE PROVIDED TO THE DISTRICT WITHIN 60 DAYS OF COMPLETION OF SHORELINE RECONSTRUCTION WORK. ANY IMPACTED MANGROVE AREAS WILL BE INDICATED ON THE SURVEY. IF ANY MANGROVES ARE IMPACTED, A MITIGATION PLAN WILL BE SUBMITTED WITHIN 90 DAYS OF THE SURVEY. THE PLAN WILL IDENTIFY MANGROVE MITIGATION AT A RATIO OF THREE ACRES OF MITIGATION FOR EACH ACRE IMPACTED. THE MITIGATION WILL BE ON THE PROJECT SITE. MITIGATION SUCCESS WILL BE DEFINED AS 80%COVERAGE BY MANGROVES FOR TWO CONSECUTIVE YEARS.
10. EXCEPT AS PROVIDED HEREIN, THIS PROJECT DOES NOT CONSTITUTE MITIGATION FOR ANY WORKS WITHIN THE JURISDICTION OF PART IV OF CHAPTER 373, F.S.
11. TURBIDITY SHALL BE MONITORED IN ACCORDANCE WITH EXHIBITS 7A-7E. IF TURBIDITY AT ANY SAMPLE POINT EXCEEDS TURBIDITY AT ANY BACKGROUND POINT BY 29 NTU'S OR GREATER, THE PROJECT SHALL CEASE CONSTRUCTION. CONSTRUCTION SHALL NOT RESUME UNTIL THE TURBIDITY CONTROL PROBLEM IS CORRECTED AND THE DISTRICT CONCURS.

THE 150 METER DISTANCE BETWEEN THE 'BACKGROUND' AND 'COMPLIANCE' STATIONS SHOWN ON EXHIBIT 7D IS THE MIXING ZONE. ELEVATED TURBIDITY LEVELS WITHIN THE MIXING ZONE WILL NOT BE A VIOLATION OF THIS PERMIT. HOWEVER, TURBIDITY SHALL BE WITHIN 29 NTU'S OF NATURAL BACKGROUND OUTSIDE OF THE MIXING ZONE.

GENERAL CONDITIONS

1. ALL ACTIVITIES AUTHORIZED BY THIS PERMIT SHALL BE IMPLEMENTED AS SET FORTH IN THE PLANS, SPECIFICATIONS AND PERFORMANCE CRITERIA AS APPROVED BY THIS PERMIT. ANY DEVIATION FROM THE PERMITTED ACTIVITY AND THE CONDITIONS FOR UNDERTAKING THAT ACTIVITY SHALL CONSTITUTE A VIOLATION OF THIS PERMIT AND PART IV, CHAPTER 373, F.S.
2. THIS PERMIT OR A COPY THEREOF, COMPLETE WITH ALL CONDITIONS, ATTACHMENTS, EXHIBITS, AND MODIFICATIONS SHALL BE KEPT AT THE WORK SITE OF THE PERMITTED ACTIVITY. THE COMPLETE PERMIT SHALL BE AVAILABLE FOR REVIEW AT THE WORK SITE UPON REQUEST BY THE DISTRICT STAFF. THE PERMITTEE SHALL REQUIRE THE CONTRACTOR TO REVIEW THE COMPLETE PERMIT PRIOR TO COMMENCEMENT OF THE ACTIVITY AUTHORIZED BY THIS PERMIT.
3. ACTIVITIES APPROVED BY THIS PERMIT SHALL BE CONDUCTED IN A MANNER WHICH DOES NOT CAUSE VIOLATIONS OF STATE WATER QUALITY STANDARDS. THE PERMITTEE SHALL IMPLEMENT BEST MANAGEMENT PRACTICES FOR EROSION AND POLLUTION CONTROL TO PREVENT VIOLATION OF STATE WATER QUALITY STANDARDS. TEMPORARY EROSION CONTROL SHALL BE IMPLEMENTED PRIOR TO AND DURING CONSTRUCTION, AND PERMANENT CONTROL MEASURES SHALL BE COMPLETED WITHIN 7 DAYS OF ANY CONSTRUCTION ACTIVITY. TURBIDITY BARRIERS SHALL BE INSTALLED AND MAINTAINED AT ALL LOCATIONS WHERE THE POSSIBILITY OF TRANSFERRING SUSPENDED SOLIDS INTO THE RECEIVING WATERBODY EXISTS DUE TO THE PERMITTED WORK. TURBIDITY BARRIERS SHALL REMAIN IN PLACE AT ALL LOCATIONS UNTIL CONSTRUCTION IS COMPLETED AND SOILS ARE STABILIZED AND VEGETATION HAS BEEN ESTABLISHED. ALL PRACTICES SHALL BE IN ACCORDANCE WITH THE GUIDELINES AND SPECIFICATIONS DESCRIBED IN CHAPTER 6 OF THE FLORIDA LAND DEVELOPMENT MANUAL; A GUIDE TO SOUND LAND AND WATER MANAGEMENT (DEPARTMENT OF ENVIRONMENTAL REGULATION, 1988), INCORPORATED BY REFERENCE IN RULE 40E-4.091, F.A.C. UNLESS A PROJECT-SPECIFIC EROSION AND SEDIMENT CONTROL PLAN IS APPROVED AS PART OF THE PERMIT. THEREAFTER THE PERMITTEE SHALL BE RESPONSIBLE FOR THE REMOVAL OF THE BARRIERS. THE PERMITTEE SHALL CORRECT ANY EROSION OR SHOALING THAT CAUSES ADVERSE IMPACTS TO THE WATER RESOURCES.
4. THE PERMITTEE SHALL NOTIFY THE DISTRICT OF THE ANTICIPATED CONSTRUCTION START DATE WITHIN 30 DAYS OF THE DATE THAT THIS PERMIT IS ISSUED. AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF ACTIVITY AUTHORIZED BY THIS PERMIT, THE PERMITTEE SHALL SUBMIT TO THE DISTRICT AN ENVIRONMENTAL RESOURCE PERMIT CONSTRUCTION COMMENCEMENT NOTICE FORM NO. 0960 INDICATING THE ACTUAL START DATE AND THE EXPECTED COMPLETION DATE.
5. WHEN THE DURATION OF CONSTRUCTION WILL EXCEED ONE YEAR, THE PERMITTEE SHALL SUBMIT CONSTRUCTION STATUS REPORTS TO THE DISTRICT ON AN ANNUAL BASIS UTILIZING AN ANNUAL STATUS REPORT FORM. STATUS REPORT FORMS SHALL BE SUBMITTED THE FOLLOWING JUNE OF EACH YEAR.
6. WITHIN 30 DAYS AFTER COMPLETION OF CONSTRUCTION OF THE PERMITTED ACTIVITY, THE PERMITTEE SHALL SUBMIT A WRITTEN STATEMENT OF COMPLETION AND CERTIFICATION BY A REGISTERED PROFESSIONAL ENGINEER OR OTHER APPROPRIATE INDIVIDUAL AS AUTHORIZED BY LAW, UTILIZING THE SUPPLIED ENVIRONMENTAL RESOURCE PERMIT CONSTRUCTION COMPLETION/CONSTRUCTION CERTIFICATION FORM NO.0881. THE STATEMENT OF COMPLETION AND CERTIFICATION SHALL BE BASED ON ONSITE OBSERVATION OF CONSTRUCTION OR REVIEW OF ASBUILT DRAWINGS FOR THE PURPOSE OF DETERMINING IF THE WORK WAS COMPLETED IN COMPLIANCE WITH PERMITTED PLANS AND SPECIFICATIONS. THIS SUBMITTAL SHALL SERVE TO NOTIFY THE DISTRICT THAT THE SYSTEM IS READY FOR INSPECTION. ADDITIONALLY, IF DEVIATION FROM THE APPROVED DRAWINGS ARE DISCOVERED DURING THE CERTIFICATION PROCESS, THE CERTIFICATION MUST BE ACCOMPANIED BY A COPY OF THE APPROVED PERMIT DRAWINGS WITH DEVIATIONS NOTED. BOTH THE ORIGINAL AND REVISED SPECIFICATIONS MUST BE CLEARLY SHOWN. THE PLANS MUST BE CLEARLY LABELED AS "ASBUILT" OR "RECORD" DRAWING. ALL SURVEYED DIMENSIONS AND ELEVATIONS SHALL BE CERTIFIED BY A REGISTERED SURVEYOR.
7. THE OPERATION PHASE OF THIS PERMIT SHALL NOT BECOME EFFECTIVE: UNTIL THE PERMITTEE

HAS COMPLIED WITH THE REQUIREMENTS OF CONDITION (6) ABOVE, HAS SUBMITTED A REQUEST FOR CONVERSION OF ENVIRONMENTAL RESOURCE PERMIT FROM CONSTRUCTION PHASE TO OPERATION PHASE, FORM NO.0920; THE DISTRICT DETERMINES THE SYSTEM TO BE IN COMPLIANCE WITH THE PERMITTED PLANS AND SPECIFICATIONS; AND THE ENTITY APPROVED BY THE DISTRICT IN ACCORDANCE WITH SECTIONS 9.0 AND 10.0 OF THE BASIS OF REVIEW FOR ENVIRONMENTAL RESOURCE PERMIT APPLICATIONS WITHIN THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT - AUGUST 1995, ACCEPTS RESPONSIBILITY FOR OPERATION AND MAINTENANCE OF THE SYSTEM. THE PERMIT SHALL NOT BE TRANSFERRED TO SUCH APPROVED OPERATION AND MAINTENANCE ENTITY UNTIL THE OPERATION PHASE OF THE PERMIT BECOMES EFFECTIVE. FOLLOWING INSPECTION AND APPROVAL OF THE PERMITTED SYSTEM BY THE DISTRICT, THE PERMITTEE SHALL INITIATE TRANSFER OF THE PERMIT TO THE APPROVED RESPONSIBLE OPERATING ENTITY IF DIFFERENT FROM THE PERMITTEE. UNTIL THE PERMIT IS TRANSFERRED PURSUANT TO SECTION 40E-1.6107, F.A.C., THE PERMITTEE SHALL BE LIABLE FOR COMPLIANCE WITH THE TERMS OF THE PERMIT.

8. EACH PHASE OR INDEPENDENT PORTION OF THE PERMITTED SYSTEM MUST BE COMPLETED IN ACCORDANCE WITH THE PERMITTED PLANS AND PERMIT CONDITIONS PRIOR TO THE INITIATION OF THE PERMITTED USE OF SITE INFRASTRUCTURE LOCATED WITHIN THE AREA SERVED BY THAT PORTION OR PHASE OF THE SYSTEM. EACH PHASE OR INDEPENDENT PORTION OF THE SYSTEM MUST BE COMPLETED IN ACCORDANCE WITH THE PERMITTED PLANS AND PERMIT CONDITIONS PRIOR TO TRANSFER OF RESPONSIBILITY FOR OPERATION AND MAINTENANCE OF THE PHASE OR PORTION OF THE SYSTEM TO A LOCAL GOVERNMENT OR OTHER RESPONSIBLE ENTITY.
9. FOR THOSE SYSTEMS THAT WILL BE OPERATED OR MAINTAINED BY AN ENTITY THAT WILL REQUIRE AN EASEMENT OR DEED RESTRICTION IN ORDER TO ENABLE THAT ENTITY TO OPERATE OR MAINTAIN THE SYSTEM IN CONFORMANCE WITH THIS PERMIT, SUCH EASEMENT OR DEED RESTRICTION MUST BE RECORDED IN THE PUBLIC RECORDS AND SUBMITTED TO THE DISTRICT ALONG WITH ANY OTHER FINAL OPERATION AND MAINTENANCE DOCUMENTS REQUIRED BY SECTIONS 9.0 AND 10.0 OF THE BASIS OF REVIEW FOR ENVIRONMENTAL RESOURCE PERMIT APPLICATIONS WITHIN THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT - AUGUST 1995, PRIOR TO LOT OR UNIT SALES OR PRIOR TO THE COMPLETION OF THE SYSTEM, WHICHEVER OCCURS FIRST. OTHER DOCUMENTS CONCERNING THE ESTABLISHMENT AND AUTHORITY OF THE OPERATING ENTITY MUST BE FILED WITH THE SECRETARY OF STATE WHERE APPROPRIATE. FOR THOSE SYSTEMS WHICH ARE PROPOSED TO BE MAINTAINED BY THE COUNTY OR MUNICIPAL ENTITIES, FINAL OPERATION AND MAINTENANCE DOCUMENTS MUST BE RECEIVED BY THE DISTRICT WHEN MAINTENANCE AND OPERATION OF THE SYSTEM IS ACCEPTED BY THE LOCAL GOVERNMENT ENTITY. FAILURE TO SUBMIT THE APPROPRIATE FINAL DOCUMENTS WILL RESULT IN THE PERMITTEE REMAINING LIABLE FOR CARRYING OUT MAINTENANCE AND OPERATION OF THE PERMITTED SYSTEM AND ANY OTHER PERMIT CONDITIONS.
10. SHOULD ANY OTHER REGULATORY AGENCY REQUIRE CHANGES TO THE PERMITTED SYSTEM, THE PERMITTEE SHALL NOTIFY THE DISTRICT IN WRITING OF THE CHANGES PRIOR TO IMPLEMENTATION SO THAT A DETERMINATION CAN BE MADE WHETHER A PERMIT MODIFICATION IS REQUIRED.
11. THIS PERMIT DOES NOT ELIMINATE THE NECESSITY TO OBTAIN ANY REQUIRED FEDERAL, STATE, LOCAL AND SPECIAL DISTRICT AUTHORIZATIONS PRIOR TO THE START OF ANY ACTIVITY APPROVED BY THIS PERMIT. THIS PERMIT DOES NOT CONVEY TO THE PERMITTEE OR CREATE IN THE PERMITTEE ANY PROPERTY RIGHT, OR ANY INTEREST IN REAL PROPERTY, NOR DOES IT AUTHORIZE ANY ENTRANCE UPON OR ACTIVITIES ON PROPERTY WHICH IS NOT OWNED OR CONTROLLED BY THE PERMITTEE, OR CONVEY ANY RIGHTS OR PRIVILEGES OTHER THAN THOSE SPECIFIED IN THE PERMIT AND CHAPTER 40E-4 OR CHAPTER 40E-40, F.A.C.
12. THE PERMITTEE IS HEREBY ADVISED THAT SECTION 253.77, F.S. STATES THAT A PERSON MAY NOT COMMENCE ANY EXCAVATION, CONSTRUCTION, OR OTHER ACTIVITY INVOLVING THE USE OF SOVEREIGN OR OTHER LANDS OF THE STATE, THE TITLE TO WHICH IS VESTED IN THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND WITHOUT OBTAINING THE REQUIRED LEASE, LICENSE, EASEMENT, OR OTHER FORM OF CONSENT AUTHORIZING THE PROPOSED USE. THEREFORE, THE PERMITTEE IS RESPONSIBLE FOR OBTAINING ANY NECESSARY AUTHORIZATIONS FROM THE BOARD OF TRUSTEES PRIOR TO COMMENCING ACTIVITY ON SOVEREIGNTY LANDS OR

OTHER STATE-OWNED LANDS.

13. THE PERMITTEE MUST OBTAIN A WATER USE PERMIT PRIOR TO CONSTRUCTION DEWATERING, UNLESS THE WORK QUALIFIES FOR A GENERAL PERMIT PURSUANT TO SUBSECTION 40E-20.302(4), F.A.C., ALSO KNOWN AS THE "NO NOTICE" RULE.
14. THE PERMITTEE SHALL HOLD AND SAVE THE DISTRICT HARMLESS FROM ANY AND ALL DAMAGES, CLAIMS, OR LIABILITIES WHICH MAY ARISE BY REASON OF THE CONSTRUCTION, ALTERATION, OPERATION, MAINTENANCE, REMOVAL, ABANDONMENT OR USE OF ANY SYSTEM AUTHORIZED BY THE PERMIT.
15. ANY DELINEATION OF THE EXTENT OF A WETLAND OR OTHER SURFACE WATER SUBMITTED AS PART OF THE PERMIT APPLICATION, INCLUDING PLANS OR OTHER SUPPORTING DOCUMENTATION, SHALL NOT BE CONSIDERED BINDING UNLESS A SPECIFIC CONDITION OF THIS PERMIT OR A FORMAL DETERMINATION UNDER SECTION 373.421(2), F.S., PROVIDES OTHERWISE.
16. THE PERMITTEE SHALL NOTIFY THE DISTRICT IN WRITING WITHIN 30 DAYS OF ANY SALE, CONVEYANCE, OR OTHER TRANSFER OF OWNERSHIP OR CONTROL OF A PERMITTED SYSTEM OR THE REAL PROPERTY ON WHICH THE PERMITTED SYSTEM IS LOCATED. ALL TRANSFERS OF OWNERSHIP OR TRANSFERS OF A PERMIT ARE SUBJECT TO THE REQUIREMENTS OF RULES 40E-1.6105 AND 40E-1.6107, F.A.C. THE PERMITTEE TRANSFERRING THE PERMIT SHALL REMAIN LIABLE FOR CORRECTIVE ACTIONS THAT MAY BE REQUIRED AS A RESULT OF ANY VIOLATIONS PRIOR TO THE SALE, CONVEYANCE OR OTHER TRANSFER OF THE SYSTEM.
17. UPON REASONABLE NOTICE TO THE PERMITTEE, DISTRICT AUTHORIZED STAFF WITH PROPER IDENTIFICATION SHALL HAVE PERMISSION TO ENTER, INSPECT, SAMPLE AND TEST THE SYSTEM TO INSURE CONFORMITY WITH THE PLANS AND SPECIFICATIONS APPROVED BY THE PERMIT.
18. IF HISTORICAL OR ARCHAEOLOGICAL ARTIFACTS ARE DISCOVERED AT ANY TIME ON THE PROJECT SITE, THE PERMITTEE SHALL IMMEDIATELY NOTIFY THE APPROPRIATE DISTRICT SERVICE CENTER.
19. THE PERMITTEE SHALL IMMEDIATELY NOTIFY THE DISTRICT IN WRITING OF ANY PREVIOUSLY SUBMITTED INFORMATION THAT IS LATER DISCOVERED TO BE INACCURATE.



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
WEST PALM BEACH REGULATORY OFFICE
400 NORTH CONGRESS AVENUE, SUITE 130
WEST PALM BEACH, FLORIDA 33401

Lake Worth Lagoon

DEPARTMENT OF THE ARMY PERMIT (DUPLICATE)

Permittee: Palm Beach County Board of County Commissioners

Permit No. 200002515 (IP-KBH)

Issuing Office: U.S. Army Engineer District, Jacksonville

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: to place an estimated volume of 1,222,559 cubic yards of fill material within approximately 99 acres of previously disturbed tidal waters in Lake Worth. The work would consist of transporting fill material from Peanut Island and John's Island to the project site to raise the elevation to between +1 foot NGVD and -5 foot NGVD. The post-construction features will include the restoration of 1.7 acres of existing mangrove fringe, creation of 11.1 acres of red mangrove habitat, 2.8 acres of smooth cordgrass (*Spartina alterniflora*) wetlands, 2.3 acres of oyster reef, and 57.1 acres of seagrass restoration by the filling of previously excavated submerged bottom to elevations of -5.0 NGVD or shallower. In addition, the project would include the installation of 7,400 linear feet of rip-rap for shoreline stabilization, the removal of 5200 feet of armored shoreline protection, and the placement of fill material in 0.4 acres of tidal waters to enlarge 2 golf tees. The project is as shown and described on attached project drawings, sheets 1-7, dated 05-30-02.

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PERMITTEE: Palm Beach County Board of County Commissioners
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Project Location: The project is located in Sections 15 and 22, Township 44 South, Range 43 East in Lake Worth in Palm Beach County, Florida.

Geographic Position: Latitude 26°37' 30" North
Longitude 80°02' 44" West

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on May 30, 2007. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit, you must obtain the signature and mailing address of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your

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PERMITTEE: Palm Beach County Board of County Commissioners
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convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

The attached Special Conditions are applicable only to the above referenced Permit Number:

1. Fill material used for this project shall be limited to suitable, clean fill material, which excludes items such as trash, debris, car bodies, asphalt, construction materials, concrete block with exposed reinforcement bars, and soils contaminated with any toxic substance, in toxic amounts (see Section 307 of the Clean Water Act).
2. Reduction and/or elimination of turbid water conditions and the erosion of disturbed or filled areas in adjacent waterbodies and wetlands are to be achieved through the use of silt curtains or screens, between the construction area and wetlands or surface waters, during periods of fill placement. Such devices shall be properly maintained until such time as those disturbed areas become sufficiently stabilized by natural recruitment of vegetation or other measures.
3. The applicant will adhere to the Standard Manatee Protection Guidelines (attached) during the construction of this project.
4. The permittee shall comply with the conditions specified in the South Florida Water Management District Permit Number 50-04766-P (Attachment Number 2).
5. The permittee shall be responsible for implementing the Turbidity Control and Monitoring Plan (Attachment Number 3).
6. The permittee shall be responsible for implementing the City of Lake Worth Wetland Restoration Project Mitigation and Monitoring Plan (Attachment Number 4).

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6. The permittee shall furnish the U.S. Army Corps of Engineers, at the letterhead address, an "As built Drawing" of the completed project including a certified/sealed drawing which includes elevations illustrating the total amount of wetlands impacted by the project. This survey shall be furnished within 30 days of completion of the authorized work for verification and acceptance by the Corps.

7. This project, estimated to cost over \$13 million dollars, will be covered through several restoration programs with the remaining funds coming from the Florida Inland Navigation District (FIND). Therefore, a portion of this project will be considered for future mitigation needs for FIND public works projects based on the performance of the restoration work at the time FIND makes the request that it be utilized. The applicant will perform a final pre-construction environmental resource survey prior to restoring the site to provide a baseline with which to compare future successes.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

(X) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

() Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

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PERMITTEE: Palm Beach County Board of County Commissioners
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d. This permit does not authorize interference with any existing or proposed Federal projects.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces, which this office did not consider in reaching the original public interest decision.

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Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

5. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

7. If the work authorized is not completed on or before May 30 2007, authorization, if not previously revoked or specifically extended, shall cease, and be null and void. Please refer to the attached form, *Notification of Administrative Appeal Options and Process*, concerning your options on acceptance of this permit.

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Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.



(PERMITTEE)

*Jon Van Arnam, Deputy Director
Environmental Resources Management*

5/31/02

(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.



(DISTRICT ENGINEER)

*James G. May
Colonel, U.S. Army*

5-31-02

(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE-SIGNATURE)

(DATE)

(NAME-PRINTED)

(ADDRESS)

(CITY, STATE, AND ZIP CODE)

PERMIT NUMBER: 200002515(IP-KBH)
PERMITTEE: Palm Beach County Board of County Commissioners
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DEPARTMENT OF THE ARMY PERMIT

Attachments to Department of the Army Permit Number 200002515(IP-KBH)

1. PERMIT DRAWINGS: 7 pages, dated 05-30-02.
2. WATER QUALITY CERTIFICATION: In accordance with General Condition number 5 on page 2 of this DA permit, the South Florida Water Management District Water Quality Certificate #50-004766-P (6 pages dated 02-27-01).
3. Turbidity Control and Monitoring Plan (2 pages).
4. City of Lake Worth Wetland Restoration Project Mitigation and Monitoring Plan (5 pages).
5. Standard Manatee Construction Conditions (5 pages).

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Applicant:		File Number:	Date:
Attached is:		See Section below	
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A	
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B	
	PERMIT DENIAL	C	
	APPROVED JURISDICTIONAL DETERMINATION	D	
	PRELIMINARY JURISDICTIONAL DETERMINATION	E	

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

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B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

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REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

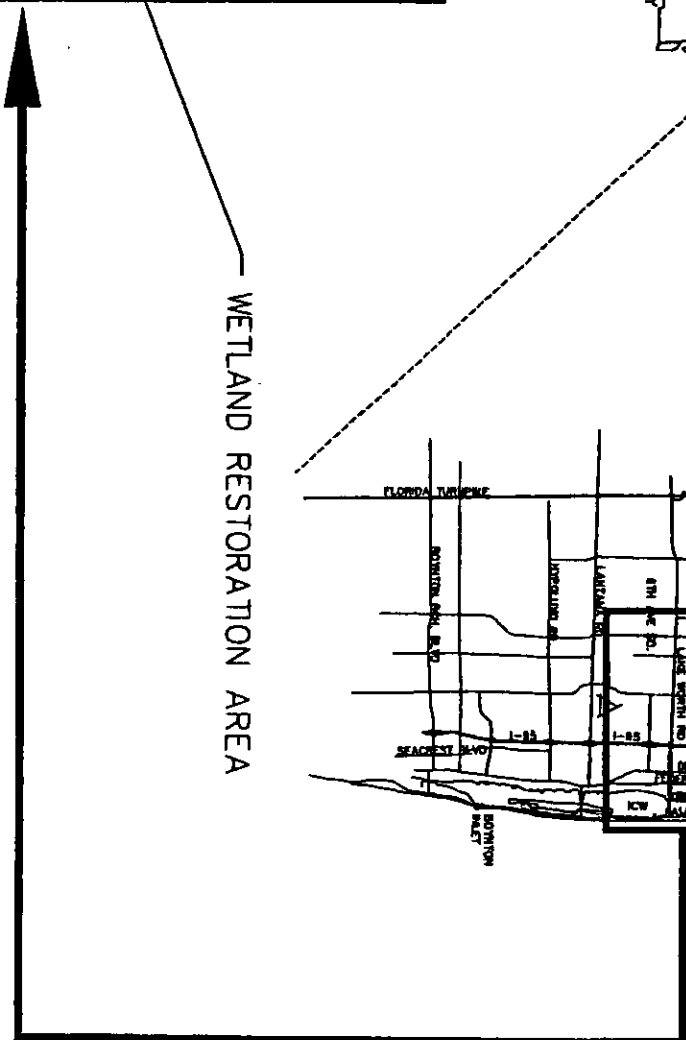
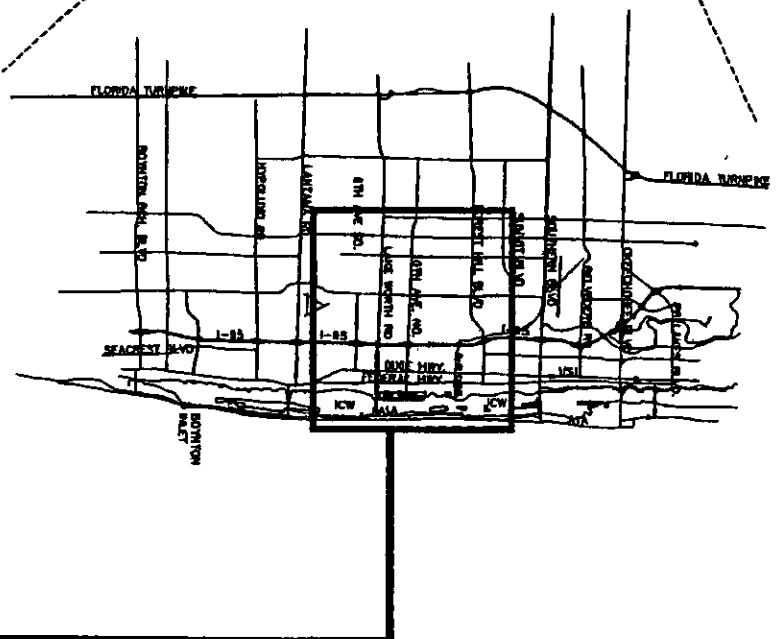
ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

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PERMITTEE: Palm Beach County Board of County Commissioners

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<p>If you have questions regarding this decision and/or the appeal process you may contact:</p>	<p>If you only have questions regarding the appeal process you may also contact:</p>	
<p>RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.</p>		
<p>Signature of appellant or agent.</p>	<p>Date:</p>	<p>Telephone number:</p>

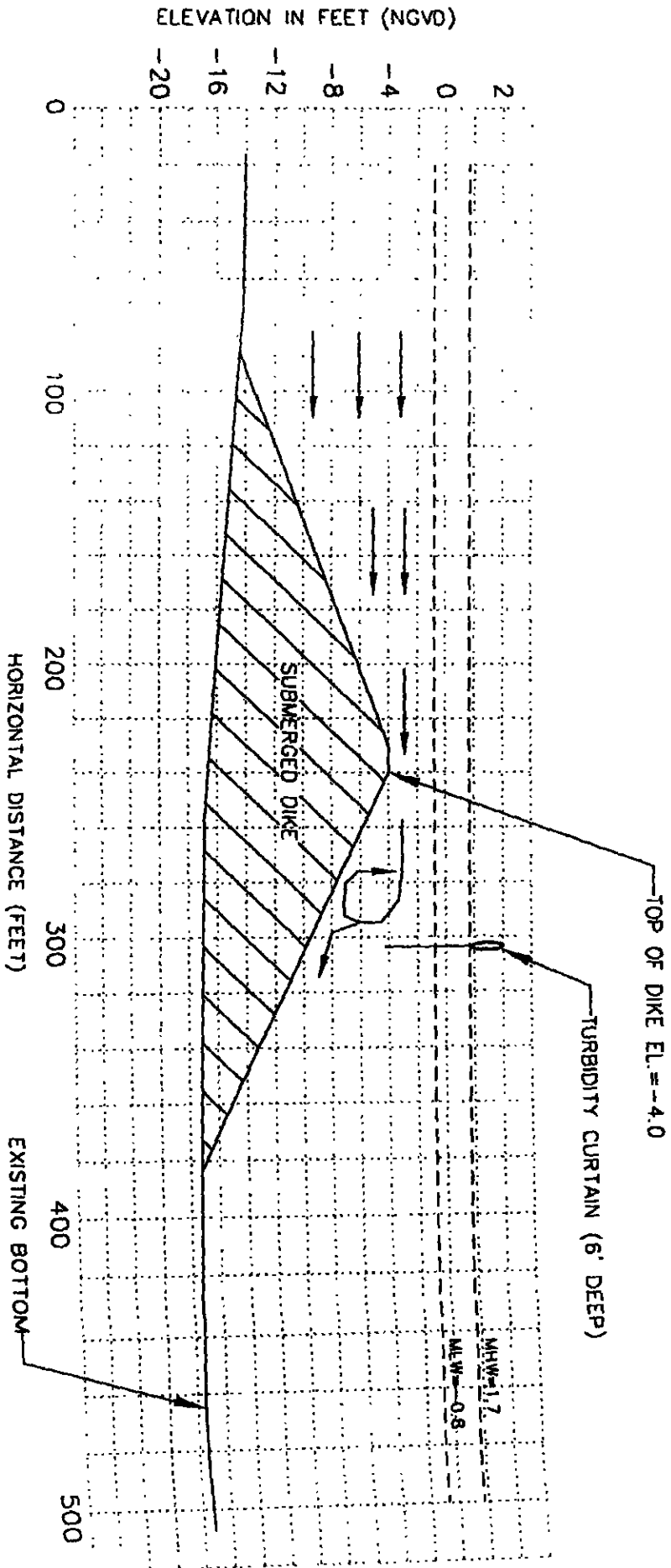


U.S. Army Corps of Engineers
Permit No. 200002515
Drawing Page 1 of 7
Date: May 30, 2002

Date: May 30, 2002

FIGURE 1.
CITY OF LAKE WORTH WETLAND RESTORATION PROJECT
LOCATION AND VICINITY MAP

N →



EBB
FLOOD

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Drawing Page 6 of 7
Date: May 30, 2002

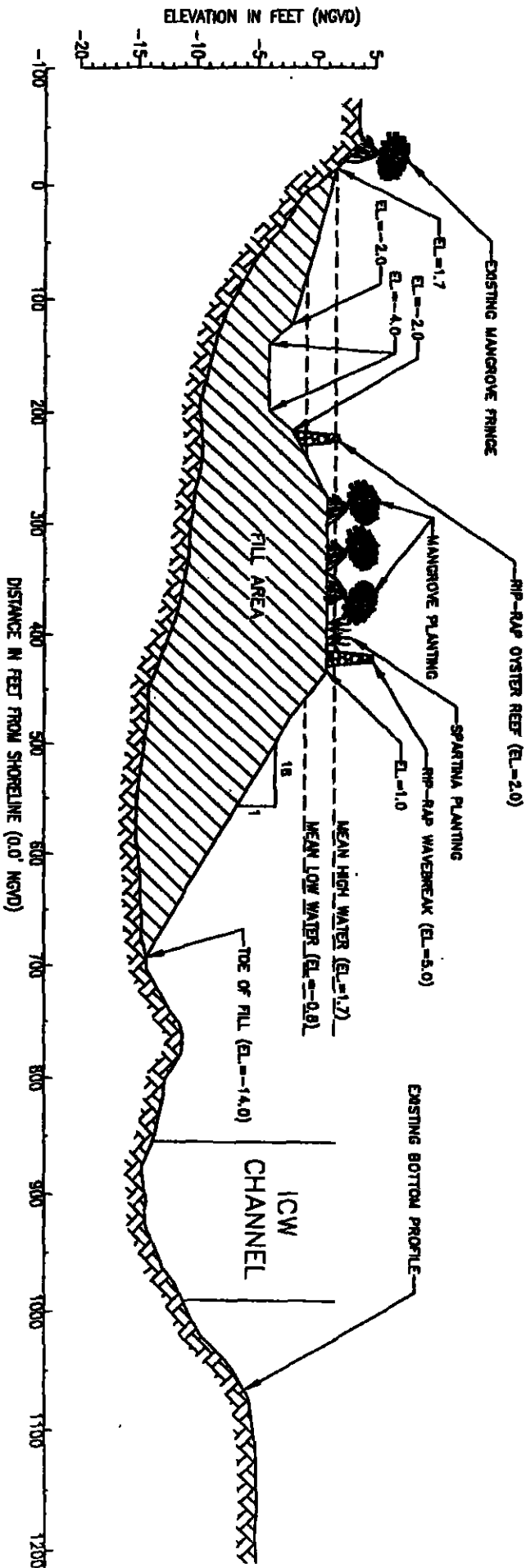


PALM BEACH COUNTY
DEPARTMENT OF
ENVIRONMENTAL
RECORDS
MANAGEMENT

FIGURE 2.
TYPICAL CROSS-SECTION
TURBIDITY CONTROL DIKE/CURTAIN

Project _____
Submitted _____
Project No. _____
Sheet _____ of _____

W → E



SECTION "C"

Quinton W. Johnson
#32070
05-25-00

U.S. Army Corps of Engineers
Permit No. 200002515
Drawing Page 5 of 7
Date: May 30, 2002

220

- NOTES:
- 1) ALL ELEVATIONS ARE IN FEET REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD).
 - 2) RED MANGROVES TO BE PLANTED 3 FEET ON CENTER; SPARTINA ALTERNIFLORA TO BE PLANTED 2 FEET ON CENTER.
 - 3) ALL SLOPES TO GRADE WEST OF MANGROVE PLANTING AREA WILL BE NO STEEPER THAN 10H:1V.



DEPARTMENT OF
ENVIRONMENTAL
RESOURCES
MANAGEMENT

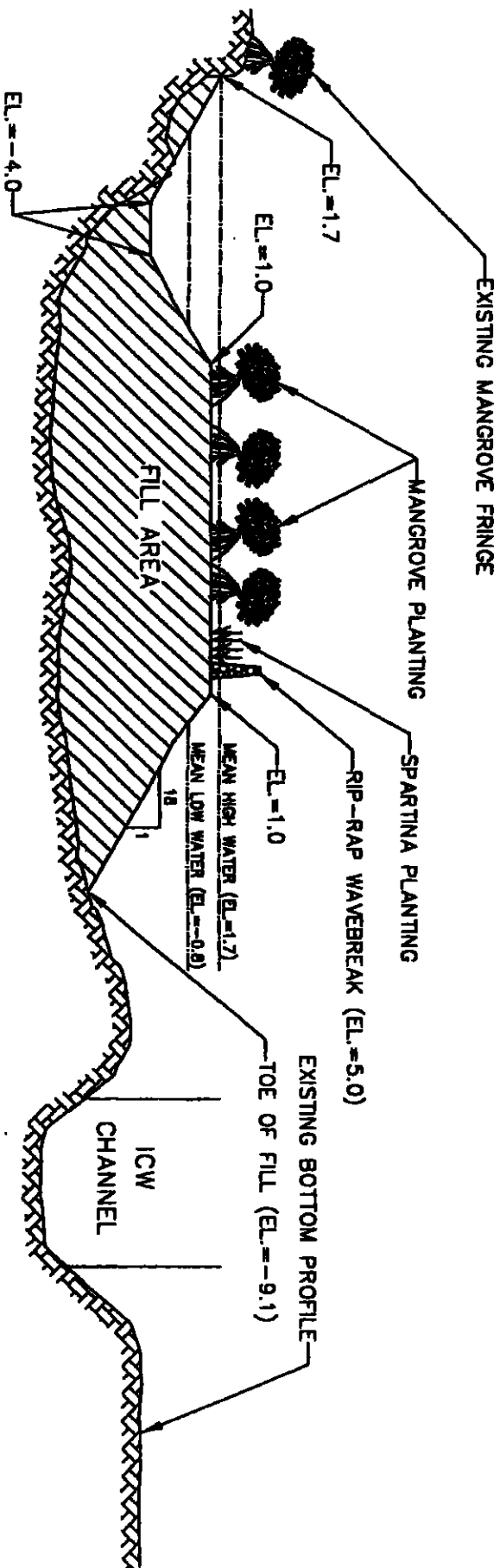
FIGURE B.
CITY OF LAKE WORTH WETLAND
RESTORATION PROJECT
SECTION "C"

ELEVATION IN FEET (NGVD)

100 200 300 400 500 600 700 800 900 1000 1100 1200 1300

DISTANCE IN FEET FROM SHORELINE (0.0' NGVD)

SECTION "A"



Oliver L. Thomas
32070
05-25-00

U.S. Army Corps of Engineers
Permit No. 200002515
Drawing Page 3 of 7
Date: May 30, 2002

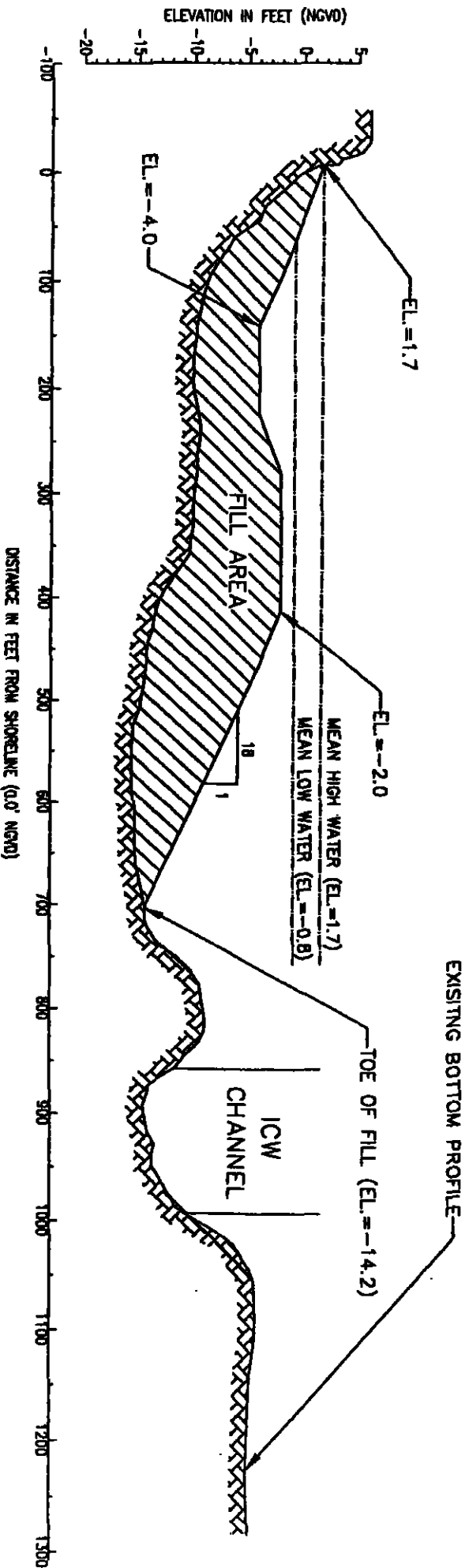
- NOTES:
- 1) ALL ELEVATIONS ARE IN FEET REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD).
 - 2) RED MANGROVES TO BE PLANTED 3 FEET ON CENTER; SPARTINA ALTERNIFLORA TO BE PLANTED 2 FEET ON CENTER.
 - 3) ALL SLOPES TO GRADE WEST OF MANGROVE PLANTING AREA WILL BE NO STEEPER THAN 10H:1V.



PAUL WEAVER COUNTY
DEPARTMENT OF
ENVIRONMENTAL
MANAGEMENT

FIGURE 6.
CITY OF LAKE WORTH WETLAND
RESTORATION PROJECT
SECTION "A"

221



SECTION "B"

NOTES:

- 1) ALL ELEVATIONS ARE IN FEET REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD).
- 2) ALL SLOPES TO GRADE NOT SPECIFIED ON DRAWING ARE NO STEEPER THAN 10H:1V.

U.S. Army Corps of Engineers
Permit No. 200002515
Drawing Page 4 of 7
Date: May 30, 2002

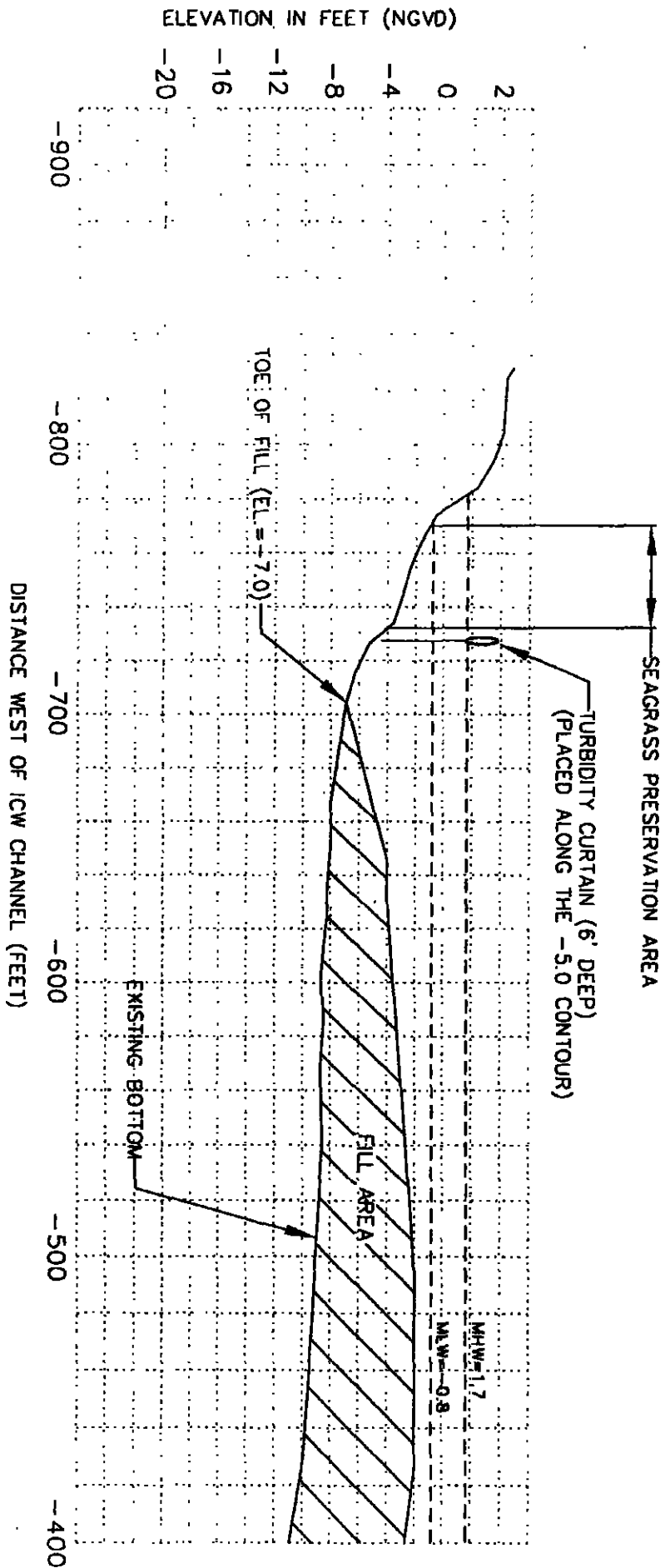
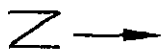
John W. Shaw
#32070
65-25-00



PAUL BAKER COUNTY
DEPARTMENT OF
ENVIRONMENTAL
MANAGEMENT

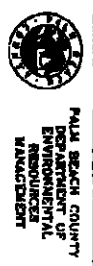
FIGURE 7.
CITY OF LAKE WORTH WETLAND
RESTORATION PROJECT
SECTION "B"

222



U.S. Army Corps of Engineers
Permit No. 200002515
Drawing Page 7 of 7
Date: May 30, 2002

FIGURE 3.
TYPICAL CROSS-SECTION
TURBIDITY CURTAIN AROUND SEAGRASS
PRESERVATION AREAS 223



Project _____
Sheet _____ of _____

APPENDIX F – OTHER STUDIES

**DRAFT MARINE SEAGRASS SURVEY
FOR
INTRACOASTAL WATERWAY IN THE VICINITY
OF PALM BEACH HARBOR**

October 1998

Contract No. DACW17-94-D-0019
Requisition No. W32CS58259-2718

Prepared for:

**Jacksonville District Office
U.S. Army Corps of Engineers
400 West Bay Street
Jacksonville, Florida 32202-4412**

Prepared by:

**Lotspeich and Associates, Inc.
422 West Fairbanks Avenue, Suite 201
Winter Park, Florida 32789**

December 1998
L&A DOC: AHHD\56042L04.REP

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Submerged Aquatic Vegetation - SAV	2
RECOMMENDATIONS	3

INTRODUCTION

Location

The site of the seagrass survey was the Intracoastal Waterway (ICW) in the vicinity of Palm Beach Harbor, Palm Beach County, Florida.

Project Objective

The objective of the marine seagrass survey was to document the presence or absence of marine seagrasses where dredging is proposed. If seagrasses were present, the location, density and acreage would be documented. Density was characterized as patchy, sparse, moderate or heavy coverage. Of particular concern was the species *Halophila johnsonii*, an endangered species which is known to occur within the survey area and is generally more abundant near inlets.

METHODS AND MATERIALS

A field survey of the ICW in the vicinity of Palm Beach Harbor was conducted to determine the location, density, and acreage of marine seagrasses. The survey was conducted for a distance of approximately six and one-tenth miles (33,000 feet). The southern limit of the survey was approximately 2,000 feet south of State Road 704 (Royal Park Bridge, Cut P-41) and extended north of Palm Beach Harbor to the State Road 708 Bridge (Cut P-34, Blue Heron Boulevard). Transects perpendicular to the ICW were surveyed at approximate 100 foot intervals. Transects extended a minimum of 100 feet to each side of the center of the existing navigation channel. Strong winds during the survey period associated with tidal currents often made exact positioning of the survey vessel difficult. Winds were particularly adverse on October 23 and 27, blowing in excess of 25 knots from the north and northeast, and predetermined survey tracks could not be maintained.

Bottom type was documented with video received from a towed underwater camera, and recorded on Hi-8 mm video format. The video was copied to VHS format tape and will be presented with the final report.

Position based on geographic (latitude, longitude) start and end points for each transect were calculated prior to conducting the field survey. These positions were used as locating points to maintain transect spacing. The transect navigation track was recorded on a laptop computer coupled with an Apelco 560 fishfinder with an integrated differential global positioning system (DGPS).

Vessel position, water column depth, water temperature, and time were recorded every 5 seconds on a laptop computer connected to the NMEA 0183 interface. Vessel speed was adjusted to acquire a satisfactory video image while maintaining a reasonable survey speed. Seagrass locations were noted and logged based on time (hh:mm:ss) which was correlated to the computer logged vessel position.

RESULTS

Survey Track Lines

Figure 1 illustrates the survey area. Coverage segments are color coded by date of survey. Figures 2 - 6 illustrate the survey vessel track lines for each day. The area in the vicinity of Peanut Island was surveyed on both October 27 and October 30, 1998. Additional coverage was obtained on October 30 to supplement the data of October 27 which was collected under adverse weather conditions. This area was also where the majority of seagrasses were located.

Submerged Aquatic Vegetation - SAV

There was considerable SAV located within the survey area within the northernmost section. This area, in the vicinity of Peanut Island, receives the benefits of clean water exchange through the Lake Worth Inlet. Four species of seagrasses were observed within the survey area: *Halodule wrightii*, *Syringodium filiforme*, *Thalassia testudinum*, and *Halophila englemannii*. The species of *Halophila* was confirmed by retrieving several specimens for identification in the laboratory. The threatened seagrass, *Halophila johnsonii*, was not directly observed. However, due to their small size, species of *Halophila* cannot be differentiated reliably by the survey method used since blade placement, length, and morphology must be considered for species identification.

Exclusive of the deep harbor, the area near the inlet appeared to be very suitable habitat for seagrass growth. In this area, there is substantial exchange of bay water with the relatively cleaner ocean waters. The substratum predominantly consists of medium to fine quartz sands with varying quantities of shell material. Patches of rock occur naturally in the vicinity of Peanut Island, to the immediate south of the Harbor and at occasional places further south near the ICW. The patches of rock supported communities of epifauna and flora (live-bottom) and were usually dominated by red algae. Sponges were also present at some of these locations.

Patches of seagrass were quite abundant within the ICW to the west and north west of Peanut Island (Cut P-35). There were also notable patches of seagrass to the immediate south of the Harbor. Species composition of the patches varied. *Halodule* and *Halophila* were the most abundant of the species within the surveyed area. In general, *Halodule* was limited to the very shallow periphery of the survey. In contrast, the patches of *Halophila* were the deepest occurring of the seagrass. The effect of the *Halophila* colonies on the substratum was visually notable, acting as a binding agent, with the patches often having the appearance of raised mounds. The substratum of the *Halophila* patches was most often fine sand. A small number of specimens were returned to the laboratory for verification and exhibited flowers and fruiting bodies.

Thalassia and *Syringodium* were the least abundant of the seagrasses within the survey area.

Seagrasses coverage diminished markedly to the south of the Harbor. A thick algal mat was found to cover much of the bottom in the southern portions of the survey area. Accumulations of drift algae were also observed in the southern areas.

Figure 7 illustrates point locations at which seagrasses were observed. Contours of distribution and aerial coverages are being calculated. Figure 8 illustrates the occurrence of patches of *Halophila* sp. *Halophila* followed the trend of seagrasses in general with diminished abundance to the south of the Harbor.

RECOMMENDATIONS

There are substantial seagrass communities present within the ICW in the vicinity of Peanut Island. The presence of the genus *Halophila* is of concern since Palm Beach Harbor falls within the range of the threatened species, *Halophila johnsonii*.

Due to the number of possible seagrass beds within the proposed dredging area, a closer inspection of the *Halophila* is warranted. It is suggested that divers make inspections of as many beds as possible to determine if *Halophila johnsonii* is present. Underwater magnification devices will be required. Small samples taken from each of the beds inspected should also be verified aboard the survey vessel under a dissecting microscope. Inspections should be conducted during peak growing season, Summer of 1999, as Winter die back may make the beds or the plants less conspicuous.

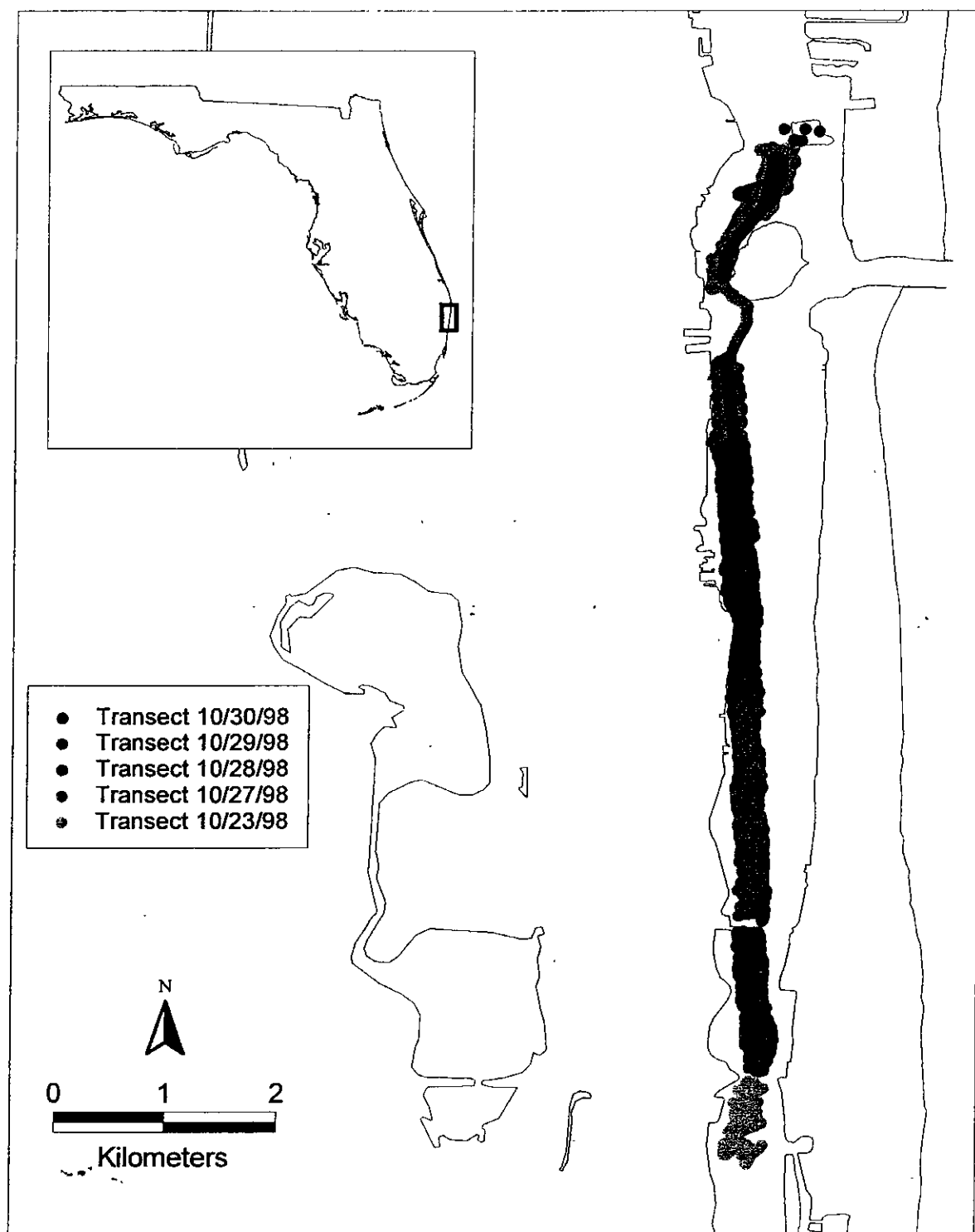


Figure 1. Seagrass survey area in the Intra Coastal Waterway (ICW) in the vicinity of Palm Beach Harbor conducted October 23 to October 30, 1998.

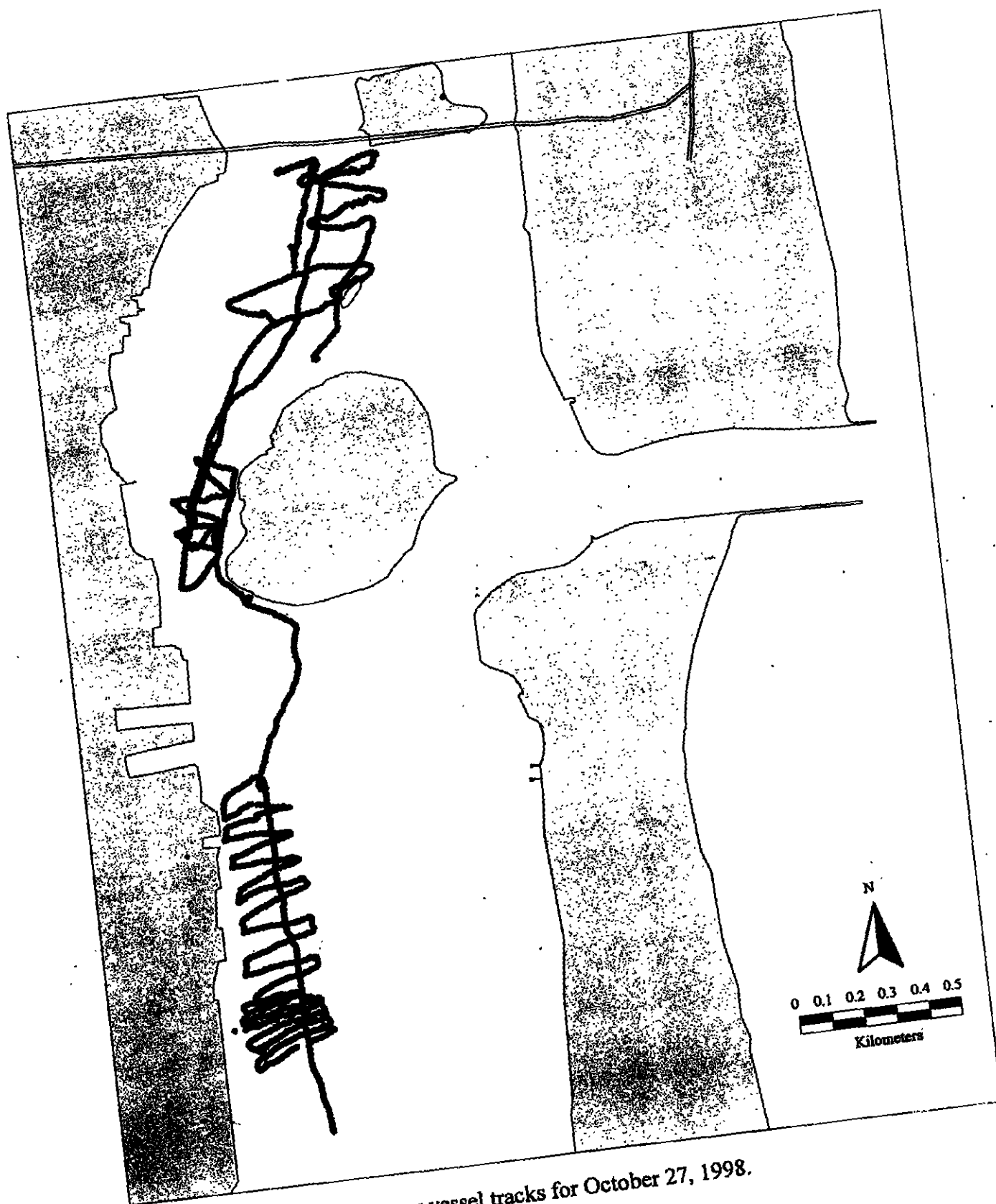


Figure 2. Seagrass survey vessel tracks for October 27, 1998.

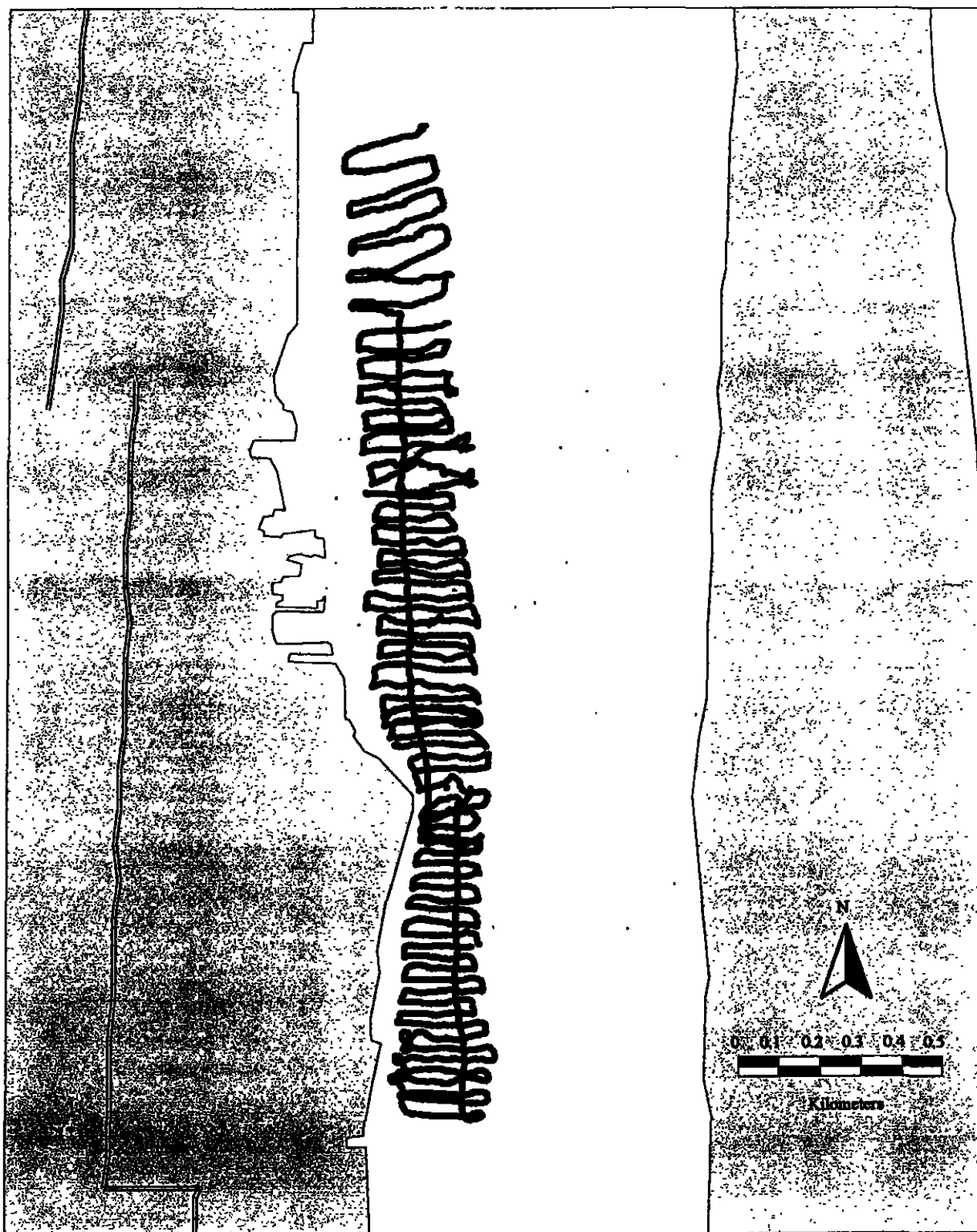


Figure 3. Seagrass survey camera track for October 28, 1998.

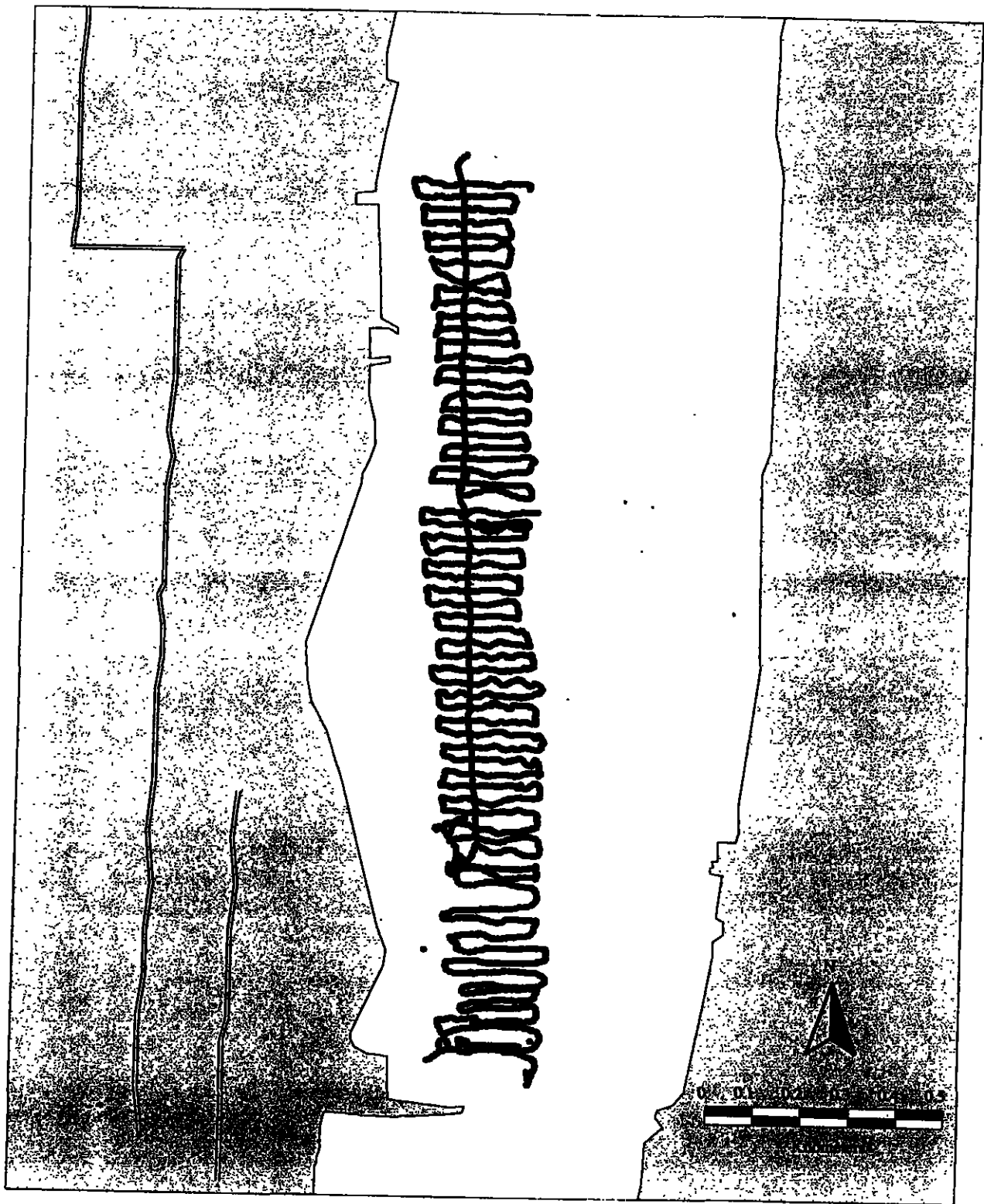


Figure 4. Seagrass survey camera track for October 29, 1998.

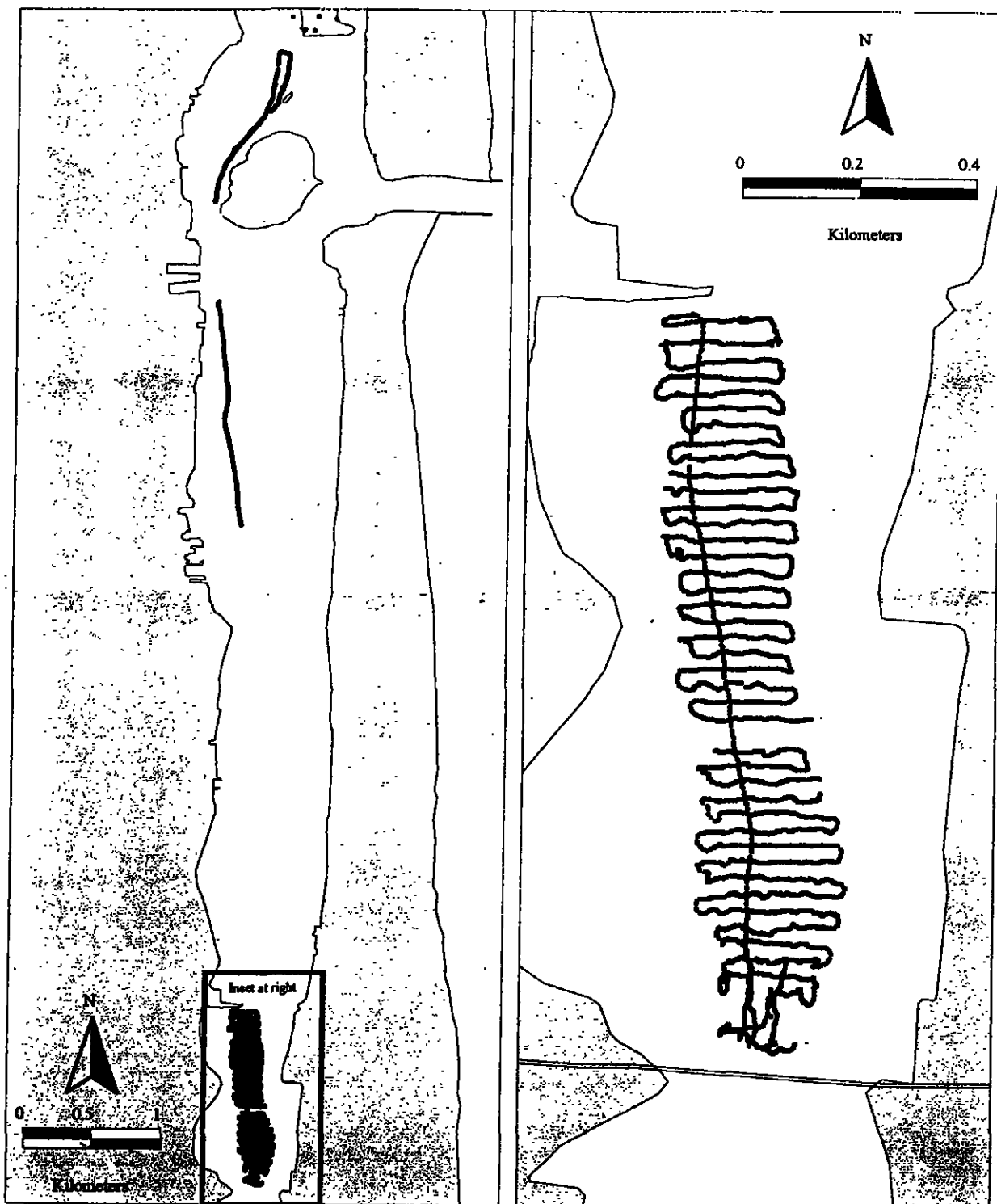


Figure 5. Seagrass survey camera track for October 30, 1998.

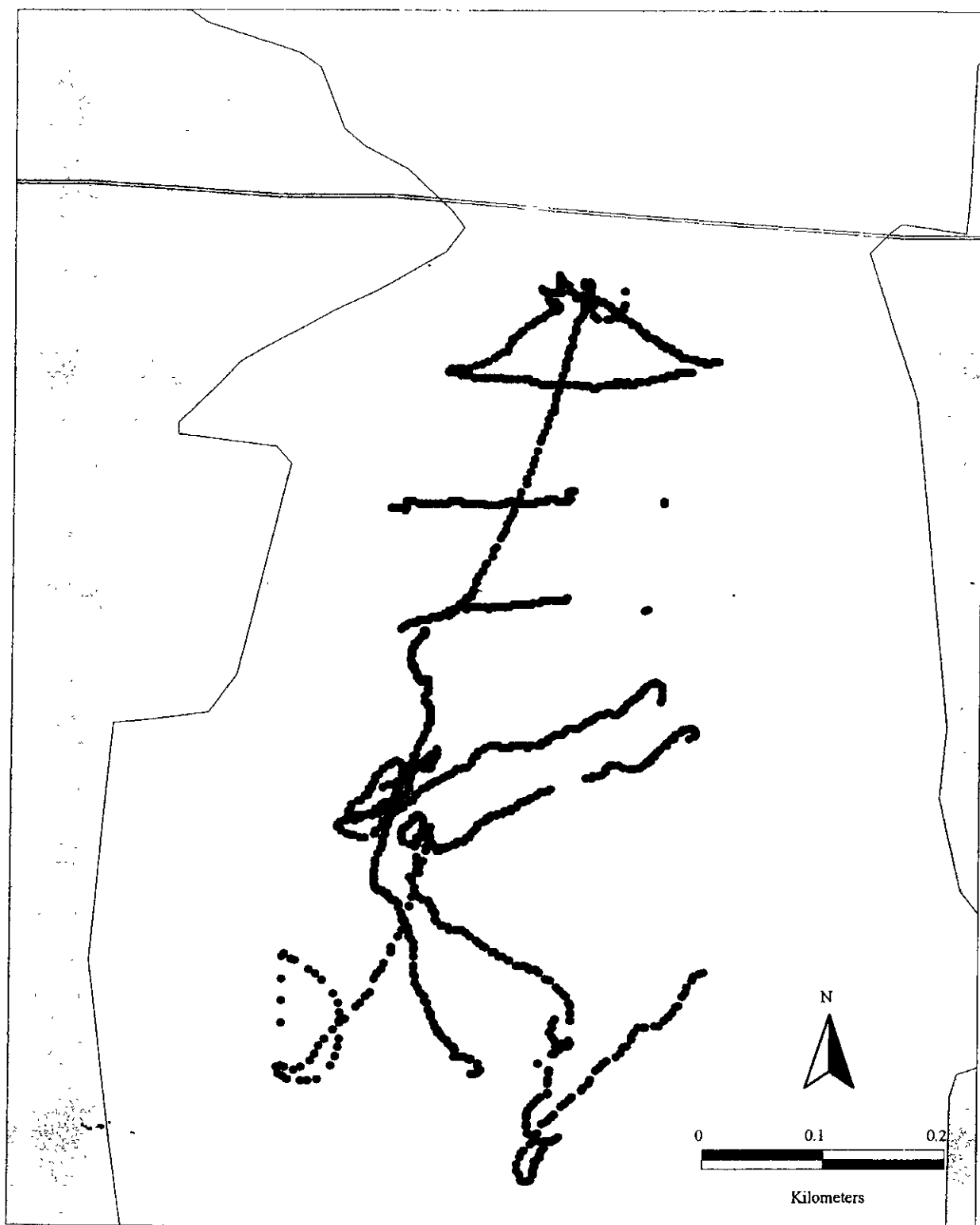


Figure 6. Seagrass survey camera track for October 23, 1998.

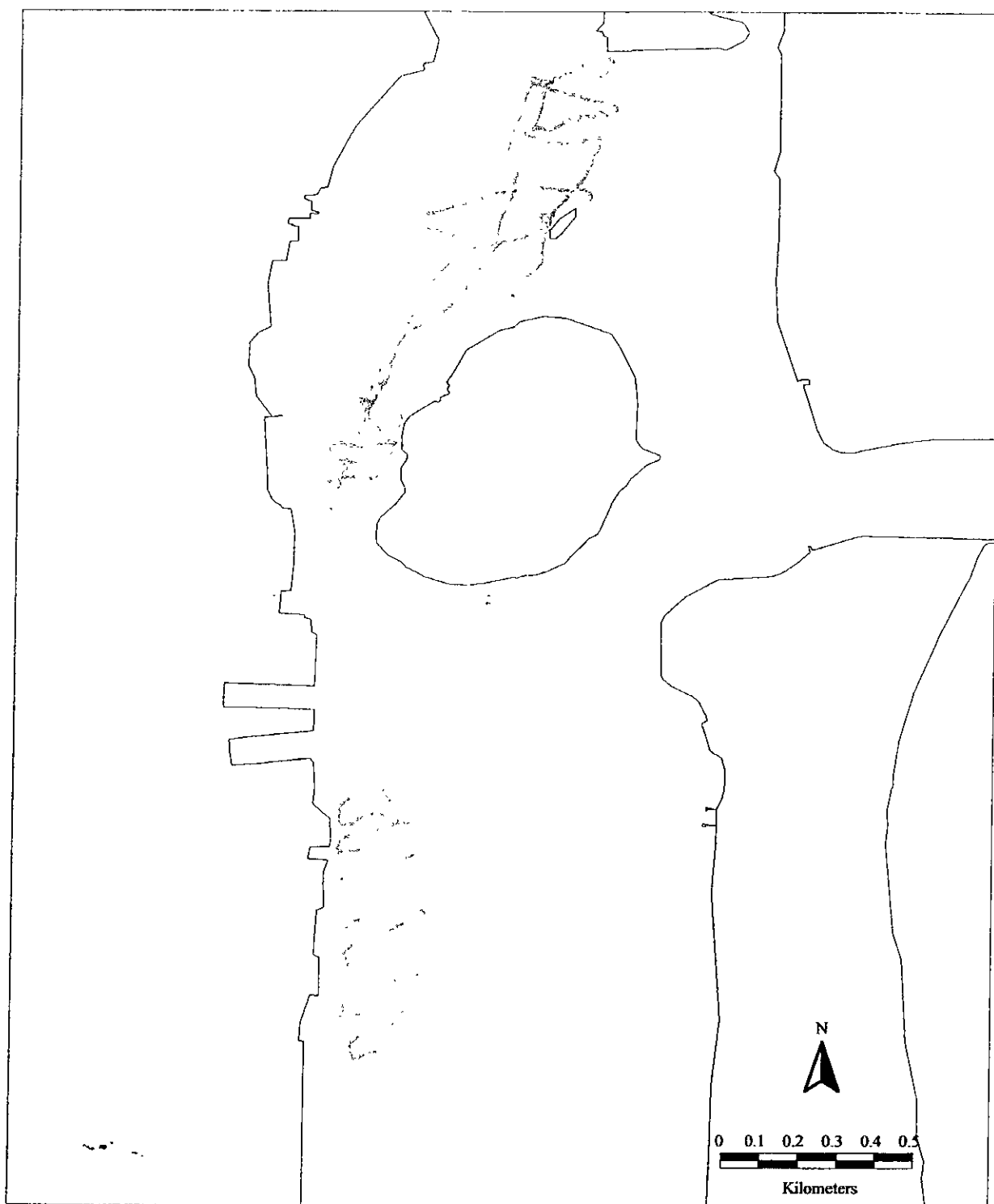


Figure 7. Point locations for detection of all species of seagrasses.

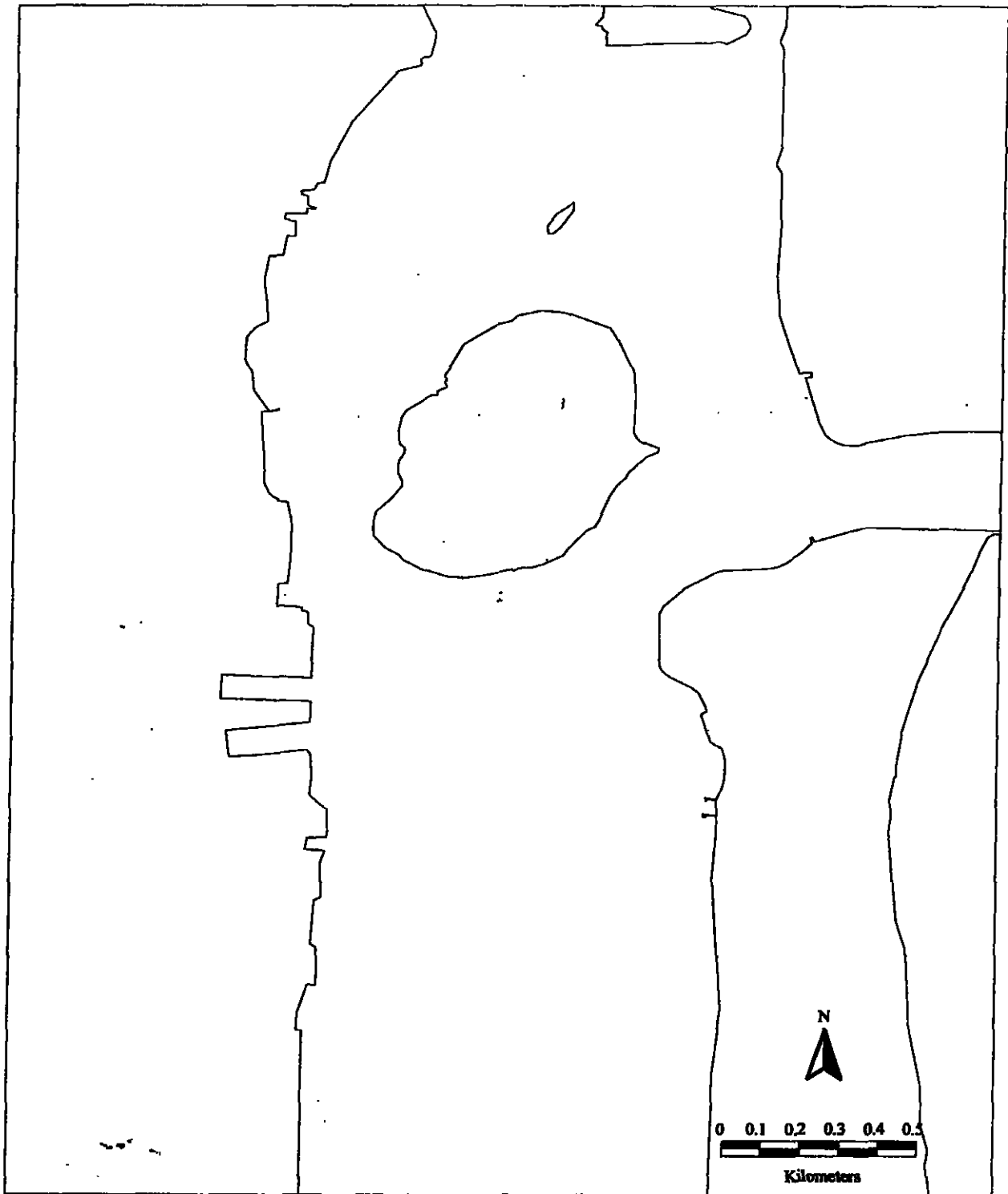


Figure 8. Point locations for detection of patches of the seagrass *Halophila* sp.

**Palm Beach Harbor Lake Worth
Access Channel Expansion
Seagrass Impact Assessment
and
Conceptual Mitigation Plan**

FINAL REPORT



April 24, 2001

**Prepared for:
U.S. Army Corps of Engineers
Jacksonville District
400 West Bay Street
Jacksonville, FL 32202**

**Prepared by:
Dial Cordy and Associates Inc.
490 Osceola Avenue
Jacksonville Beach, FL 32250**

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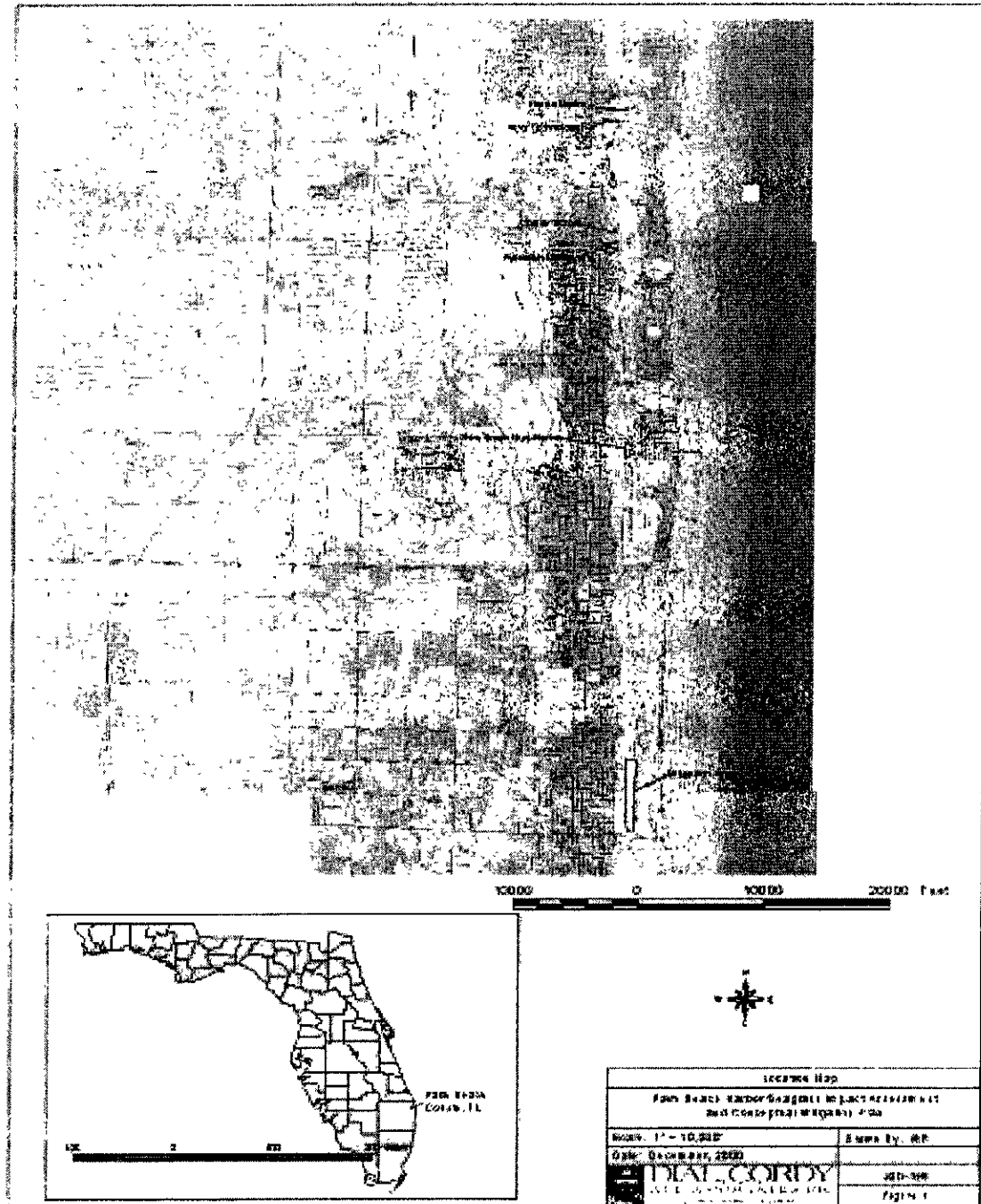
1.0 INTRODUCTION

Dial Cordy and Associates Inc. (Dial Cordy) was contracted by the Jacksonville District Corps of Engineers through Gulf Engineers & Consultants Inc. (GEC) contract (DACW17-99-D-0043) to assess the impact of dredging on marine seagrass habitat documented to occur at certain locations in Palm Beach County (Figure 1). The area of proposed dredging includes the AIWW and selected access channels and marina basins located between Florida Marine and Palm Beach Municipal Marina to the south in Palm Beach County. In addition, this report includes a conceptual mitigation plan as compensation for unavoidable impacts to seagrass habitat. Baseline seagrass surveys for the project area were previously completed (Dial Cordy 1999, 2000). A Biological Assessment for impacts to *H. johnsonii* was prepared for Section 7 coordination and is provided under separate cover.

1.1 Purpose

The objective of this report is to document the direct and indirect impacts of proposed dredging on marine seagrass resources known to occur in the AIWW and selected channels and basins adjacent to the AIWW where dredging is proposed. Specifically, this report assesses the direct loss and indirect impact of dredging on *Halophila johnsonii* (Johnson's grass), *H. decipiens* (Paddle grass), *Halodule wrightii* (Cuban shoal grass), *Thalassia testudinum* (Turtle grass), and *Syringodium filiforme* (Manatee grass) in the AIWW and six access channels and marina basins/facilities from Florida Marine north of the Port of Palm Beach to the Palm Beach Marina. Due to the protection afforded to *H. johnsonii* in 1998 by the listing of the species as a threatened marine plant, the 1999 designation by the NMFS of critical habitat for *H. johnsonii*, and of concerns by the NMFS for impacts to Essential Fish Habitat pursuant to the Manguson Stevens Fishery Conservation and Management Act (16 U.S.C. 1801-1882), an assessment of impacts on *H. johnsonii* and other seagrass species is required.

Figure 1 Location Map



1.2 Background

Recent efforts to document the distribution and occurrence of marine seagrass within Palm Beach County, including specifically the areas assessed for this project, have included a survey of marine seagrass communities within six access channels and marina basins (Dial Cordy and Associates Inc. 2000), a comprehensive survey of seagrass habitat within the federal AIWW channel from Hobe Sound through South Lake Worth Inlet (Dial Cordy and Associates Inc. 1999), and a video survey of marine seagrass within the AIWW of Palm Beach County by the Jacksonville District, Corps of Engineers (Lotspeich and Associates, Inc. 1998). Additional studies or surveys available include a summary of *H. johnsonii* occurrences in South Florida (PBS&J, in progress), and a Natural Resource Inventory of the Lake Worth shoals (Palm Beach County Department of Environmental Resource Management 1990). Other studies or surveys specifically on *H. johnsonii* include intensive surveys in Jupiter and Hobe Sound, and near Fort Pierce Inlet (Kenworthy 1993; Gallegos and Kenworthy 1996); an analysis of growth dynamics of the species (Bolen 1997); and unpublished data collected by the Department of Environmental Protection (FDEP) at potential marina sites along the AIWW (FDEP 1997).

2.0 TECHNICAL APPROACH

A description of analysis techniques and assumptions are presented in this section

2.1 Impact Analysis

For purposes of the impact analysis the following assumptions were made based on field observations (Dial Cordy 1999, 2000):

- Seagrass will not naturally recolonize following dredging below 12 feet MSL between the Port of Palm Beach and Florida Marine.

- Seagrass will not naturally recolonize following dredging below 10 feet MSL south of the Port of Palm Beach.
- Side slopes of the AIWW channel on the average have a 1:3 slope ratio (rise over run).
- Side slopes of the access channels and marina basins were based on existing bathymetric contours.
- Direct or permanent impacts include the area of seagrass located on the channel bottom and areas of the side slope below the above stated depths.
- Temporary or indirect impacts include the area of the side slopes where recolonization will occur following resettlement after dredging or in less than 12 feet MSL within channels north of the harbor.
- Channel side slopes will average a 1:3 slope following dredging.
- Area of impact for each seagrass cover type was determined by calculating the polygon cover area and multiplying this area by the average frequency of occurrence calculated from quadrat data (Dial Cordy 1999, 2000).

With these assumptions in mind a model was developed to determine the direct (permanent) and indirect (temporary) impacts for incremental dredging depths 12, 14, 16, and 17 feet below MSL, referred to as Projects 10, 12, 14, and 15 in the following results.

2.2 Conceptual Mitigation Plan

Development of the conceptual mitigation plan included an assessment of the existing site conditions at the mitigation area, including seagrass present (Dial Cordy 2000), depths, an evaluation of the feasibility of restoring shallow water habitat suitable for the propagation of seagrass species. Restoration methods most suitable for the site were analyzed, including disposal of dredged material to raise the bottom depths to the photic zone and planting of seagrass species from donor material in the proposed dredged areas.

3.0 IMPACT ASSESSMENT

A summary of direct (permanent) and indirect (temporary) impacts for the main federal portion of the AIWW channel (Cut 35, through Cut 36, 97+13), Florida Inland Navigation District section of the AIWW (Cut 36, 97+13 through Cut 41, 7+50), and all facilities (access channels and basins) are presented in Table 1. More detailed results of the seagrass impact analysis for incremental depths are provided in Tables 2-5. Figure 2 illustrates the locations where impacts to seagrass communities will occur. Locations of seagrass impacts within the federal channel are not depicted in Figure 1 due to the wide distance between survey transects (250 ft). Impacts were extrapolated based on belt transect and quadrat data (Dial Cordy and Associates Inc. 1999).

The estimated total permanent and temporary impacts to seagrass for Projects 10, 12, 14, and 15 are 14.81 acres, 2.20 acres; 16.33 acres, 2.62 acres; 18.11 acres, 2.77 acres; and 18.59 acres, 2.82 acres, respectively. With an increased dredging depth of 5 feet (Projects 10 to 15), the total impacts increase from 17.01 acres to 21.39 acres, which implies an average increase in impacts of 0.88 acre per foot dredged. Total impacts (permanent and temporary) to *H. johnsonii* ranged from 4.53 acres for Project 10 (depth 12 feet) to 5.57 acre for Project 15 (depth 17 feet). The projected average incremental increase in impact to *H. johnsonii* is 0.21 acre per foot of dredging depth. A review of project impacts for each area is provided below.

3.1 Federal Channel

This section of the AIWW includes the area proposed by the Corps of Engineers for dredging from south of the Blue Heron Bridge to Cut 36, 97+13 and the area under FIND authority further south from Cut 36, 97+13 to Cut 41, 7+50 (Tables 2-5, Figure 2). A description of the incremental project impacts is summarized in the following sub-sections.

Table 1 Seagrass Impacts for Federal Channel, FIND Channel, and Marine Facilities

	Project 10			Project 12			Project 14			Project 15		
	Perm	Temp	Total	Perm	Temp	Total	Perm	Temp	Total	Perm	Temp	Total
FEDERAL PORTION OF AIWW												
Total <i>H. johnsonii</i> communities	1.62	0.35	1.97	1.83	0.48	2.31	2.11	0.53	2.64	2.17	0.52	2.69
Other seagrass communities	6.59	0.68	7.27	7.41	0.82	8.23	8.42	0.86	9.28	8.71	0.82	9.51
Total seagrass	8.21	1.03	9.24	9.24	1.30	10.54	10.53	1.39	11.92	10.88	1.34	12.20
FIND PORTION OF AIWW												
Total <i>H. johnsonii</i> communities	1.10	0.02	1.12	1.10	0.03	1.13	1.10	0.03	1.13	1.10	0.03	1.13
Other seagrass communities	0.91	0.02	0.93	0.98	0.04	1.02	1.10	0.04	1.14	1.11	0.05	1.16
Total seagrass	2.01	0.04	2.05	2.08	0.07	2.15	2.20	0.07	2.27	2.21	0.08	2.29
MARINE FACILITIES (Access Channel and Basin)												
Total <i>H. johnsonii</i> communities	1.07	0.38	1.45	1.22	0.34	1.56	1.34	0.36	1.70	1.39	0.37	1.76
Other seagrass communities	3.52	0.75	4.27	3.79	0.91	4.70	4.04	0.95	4.99	4.11	1.03	5.14
Total seagrass	4.59	1.13	5.72	5.01	1.25	6.26	5.38	1.31	6.69	5.50	1.40	6.90
Total Project - <i>H. johnsonii</i>	3.79	0.75	4.54	4.15	0.85	5.00	4.55	0.92	5.47	4.66	0.92	5.58
Total Project - Seagrass	14.81	2.20	17.01	16.33	2.62	18.95	18.11	2.77	20.88	18.59	2.82	21.39

Table 2 Project 10-Dredging Impacts on Seagrass Communities, Palm Beach County, FL

Seagrass Cover Class	Channel Perm (sq ft)	1:3 Slope Perm (sq ft)	1:3 Slope Temp (sq ft)	Total Perm (sq ft)	Total Area Impact (sq ft)	Est Impact (ac)	
						Perm	Total
Florida Marine							
HJ - Halophilla johnsonii	0	0	0	0	0	0.00	0.00
HD - Halophilla decipens	21740	0	6340	21740	28080	0.50	0.64
HW - Halodule wrightii	0	0	0	0	0	0.00	0.00
TT - Thalassia testudium	12403	0	1549	12403	13952	0.28	0.32
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	8202	0	1242	8202	9444	0.19	0.22
HJ w/ SF,TT	0	0	0	0	0	0.00	0.00
HD/TT	13520	0	3398	13520	16918	0.31	0.39
Mixed Seagrass w/o HJ	14520	0	9538	14520	24058	0.33	0.55
Total HJ Communities	8202	0	1242	8202	9444	0.19	0.22
Facility Total	70385	0	22067	70385	92452	1.62	2.12
Perry Technologies							
HJ - Halophilla johnsonii	0	0	0	0	0	0.00	0.00
HD - Halophilla decipens	41722	0	4135	41722	45857	0.96	1.05
HW - Halodule wrightii	113	0	1093	113	1206	0.00	0.03
TT - Thalassia testudium	0	0	0	0	0	0.00	0.00
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	4557	0	3010	4557	7567	0.10	0.17
HJ w/ SF,TT	0	0	0	0	0	0.00	0.00
HD/TT	12453	0	1584	12453	14037	0.29	0.32
Mixed Seagrass w/o HJ	36	0	1184	36	1220	0.00	0.03
Total HJ Communities	4557	0	3010	4557	7567	0.10	0.17
Facility Total	58881	0	11006	58881	69887	1.35	1.60
Charter School							
HJ - Halophilla johnsonii	6268	832	2449	7100	9549	0.16	0.22
HD - Halophilla decipens	0	1	13	1	14	0.00	0.00
HW - Halodule wrightii	0	0	0	0	0	0.00	0.00
TT - Thalassia testudium	9196	162	177	9358	9535	0.21	0.22
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	18643	2342	7006	20985	27991	0.48	0.64
HJ w/ SF,TT	0	0	0	0	0	0.00	0.00
HD/TT	3177	283	636	3460	4096	0.08	0.09
Mixed Seagrass w/o HJ	0	0	0	0	0	0.00	0.00
Total HJ Communities	24911	3174	9455	28085	37540	0.64	0.86
Facility Total	37284	3620	10281	40904	51185	0.94	1.18
Rybovitch Marina							
HJ - Halophilla johnsonii	2377	358	578	2735	3313	0.06	0.08
HD - Halophilla decipens	7494	704	943	8198	9141	0.19	0.21
HW - Halodule wrightii	0	0	0	0	0	0.00	0.00
TT - Thalassia testudium	11618	986	1709	12604	14313	0.29	0.33
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	2644	518	1658	3162	4820	0.07	0.11
HJ w/ SF,TT	316	55	127	371	498	0.01	0.01
HD/TT	2152	532	1162	2684	3846	0.06	0.09
Mixed Seagrass w/o HJ	0	0	0	0	0	0.00	0.00
Total HJ Communities	5337	931	2363	6268	8631	0.14	0.20

Seagrass Cover Class	Channel Perm (sq ft)	1:3 Slope Perm (sq ft)	1:3 Slope Temp (sq ft)	Total Perm (sq ft)	Total Area Impact (sq ft)	Est Impact (ac)	
						Perm	Total
Facility Total	26601	3153	6177	29754	35931	0.68	0.82
Main Channel North of Turning Basin (Cut 35, 0+00 thru Cut 36, 7+50)							
HJ - Halophyllia johnsonii	0	0	864	0	864	0.00	0.02
HD - Halophyllia decipens	187177	0	23928	187177	211105	4.30	4.85
HJ w/ HD,HW	2136	0	5397	2136	7534	0.05	0.17
HW	0	0	3238	0	3238	0.00	0.07
Total HJ Communities	2136	0	6261	2136	8397	0.05	0.19
Area Total	189313	0	33427	189313	222740	4.35	5.11
Main Channel South of Turning Basin thru Rybovitch/Spencer (Cut 36, 30+00 thru Cut 36, 97+13)							
HJ - Halophyllia johnsonii	3390	886	1915	4277	6191	0.10	0.14
HD - Halophyllia decipens	83339	16577	2708	99917	102624	2.29	2.36
HJ w/ HD,HW	58667	5434	7002	64101	71102	1.47	1.63
HW	0	0	0	0	0	0.00	0.00
Total HJ Communities	62057	6320	8916	68377	77294	1.57	1.77
Area Total	145396	22898	11624	168294	179918	3.86	4.13
Main Channel - Federal Channel Portion (Cut 35, 0+00 thru Cut 36, 97+13)							
HJ - Halophyllia johnsonii	3390	886	2778	4277	7055	0.10	0.16
HD - Halophyllia decipens	270516	16577	26636	287093	313729	6.59	7.20
HJ w/ HD,HW	60803	5434	12399	66237	78636	1.52	1.81
HW	0	0	3238	0	3238	0.00	0.07
Total HJ Communities	64193	6320	15177	70513	85691	1.62	1.97
Area Total	334709	22898	45052	357607	402658	8.21	9.24
Main Channel - F.I.N.D. Portion (Cut 36, 97+13 thru Cut 41, 7+50)							
HJ - Halophyllia johnsonii	9465	0	0	9465	9465	0.22	0.22
HD - Halophyllia decipens	36959	2763	1147	39722	40868	0.91	0.94
HJ w/ HD,HW	38537	0	625	38537	39162	0.88	0.90
HW	0	0	0	0	0	0.00	0.00
Total HJ Communities	48002	0	625	48002	48627	1.10	1.12
Area Total	84961	2763	1772	87724	89496	2.01	2.05
Comprehensive Main Channel - Florida Marine thru F.I.N.D. (Cut 35, 0+00 thru Cut 41, 7+50)							
HJ - Halophyllia johnsonii	12855	886	2778	13742	16520	0.32	0.38
HD - Halophyllia decipens	307475	19340	27783	326815	354597	7.50	8.14
HJ w/ HD,HW	99340	5434	13025	104774	117798	2.41	2.70
HW	0	0	3238	0	3238	0.00	0.07
Total HJ Communities	112195	6320	15803	118515	134318	2.72	3.08
Area Total	419670	25660	46824	445330	492154	10.22	11.30

Overall Project Area Summary - All Facilities and Main Channel (Cut 35, 0+00 thru Cut 41, 7+50)

Seagrass Cover Class	Channel Perm (sqft)	1:3 Slope Perm (sqft)	1:3 Slope Temp (sqft)	Total Perm (sqft)	Total Area Impact (sqft.)	Est. Impact (ac.)	
HJ - Halophilla johnsonii	21500	2076	5805	23577	29382	0.54	0.87
HD - Halophilla decipens	378431	20045	39214	398476	437689	9.15	10.05
HW - Halodule wrightii	113	0	4331	113	4444	0.00	0.10
TT - Thalassia testudium	33217	1148	3435	34365	37800	0.79	0.87
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	133386	8294	25941	141680	167620	3.25	3.85
HJ w/ SF,TT	316	55	127	371	498	0.01	0.01
HD/TT	31302	815	6780	32117	38897	0.74	0.89
Mixed Seagrass w/o HJ	14556	0	10722	14556	25278	0.33	0.58
Total HJ Communities	155202	10425	31873	165627	197500	3.80	4.53
Project Area Total	612821	32433	96355	645254	741609	14.81	17.02

Table 3 Project 12-Dredging Impacts on Seagrass Communities, Palm Beach County, FL

Seagrass Cover Class	Channel Perm (sqft)	1:3 Slope Perm (sqft)	1:3 Slope Temp (sqft)	Total Perm (sqft)	Total Area Impact (sqft.)	Est. Impact (ac.)	
						Perm	Total
Florida Marine							
HJ - Halophyllia johnsonii	0	0	0	0	0	0.00	0.00
HD - Halophyllia decipens	21740	2757	7516	24497	32013	0.56	0.73
HW - Halodule wrightii	0	0	0	0	0	0.00	0.00
TT - Thalassia testudium	12403	618	1371	13021	14392	0.30	0.33
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	8202	781	583	8983	9566	0.21	0.22
HJ w/ SF,TT	0	0	0	0	0	0.00	0.00
HD/TT	13520	1060	3622	14580	18202	0.33	0.42
Mixed Seagrass w/o HJ	14520	2380	13781	16900	30681	0.39	0.70
Total HJ Communities	8202	781	583	8983	9566	0.21	0.22
Facility Total	70385	7596	26873	77981	104854	1.79	2.41
Perry Technologies							
HJ - Halophyllia johnsonii	0	0	0	0	0	0.00	0.00
HD - Halophyllia decipens	41722	1635	4260	43357	47617	1.00	1.09
HW - Halodule wrightii	113	0	2172	113	2285	0.00	0.05
TT - Thalassia testudium	0	0	0	0	0	0.00	0.00
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	4557	1146	3093	5703	8796	0.13	0.20
HJ w/ SF,TT	0	0	0	0	0	0.00	0.00
HD/TT	12453	947	1294	13400	14694	0.31	0.34
Mixed Seagrass w/o HJ	36	165	1538	201	1739	0.00	0.04
Total HJ Communities	4557	1146	3093	5703	8796	0.13	0.20
Facility Total	58881	3893	12357	62774	75131	1.44	1.72
Charter School							
HJ - Halophyllia johnsonii	6268	1625	2381	7893	10274	0.18	0.24
HD - Halophyllia decipens	0	6	19	6	25	0.00	0.00
HW - Halodule wrightii	0	0	0	0	0	0.00	0.00
TT - Thalassia testudium	9196	341	69	9537	9606	0.22	0.22
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	18643	4618	6703	23261	29964	0.53	0.69
HJ w/ SF,TT	0	0	16	0	16	0.00	0.00
HD/TT	3177	538	493	3715	4208	0.09	0.10
Mixed Seagrass w/o HJ	0	0	0	0	0	0.00	0.00
Total HJ Communities	24911	6243	9100	31154	40254	0.72	0.92
Facility Total	37284	7128	9681	44412	54093	1.02	1.24
Rybovitch Marina							
HJ - Halophyllia johnsonii	2377	623	425	3000	3425	0.07	0.08
HD - Halophyllia decipens	7494	1489	617	8983	9600	0.21	0.22
HW - Halodule wrightii	0	0	0	0	0	0.00	0.00
TT - Thalassia testudium	11618	1926	1513	13544	15057	0.31	0.35
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	2644	1050	2072	3694	5766	0.08	0.13
HJ w/ SF,TT	316	116	146	432	578	0.01	0.01
HD/TT	2152	1182	1110	3334	4444	0.08	0.10
Mixed Seagrass w/o HJ	0	0	0	0	0	0.00	0.00
Total HJ Communities	5337	1789	2643	7126	9769	0.16	0.22

Seagrass Cover Class	Channel Perm (sqft)	1:3 Slope Perm (sqft)	1:3 Slope Temp (sqft)	Total Perm (sqft)	Total Area Impact (sqft.)	Est. Impact (ac.)	
						Perm	Total
Facility Total	26601	6386	5883	32987	38870	0.76	0.89
Main Channel North of Turning Basin (Cut 35, 0+00 thru Cut 36, 7+50)							
HJ - Halophila johnsonii	0	509	1005	509	1514	0.01	0.03
HD - Halophila decipens	187177	17829	27846	205005	232851	4.71	5.35
HJ w/ HD,HW	2136	1783	6281	3919	10200	0.09	0.23
HW	0	0	3769	0	3769	0.00	0.09
Total HJ Communities	2136	2292	7286	4428	11714	0.10	0.27
Area Total	189313	20121	38900	209434	248334	4.81	5.70
Main Channel South of Turning Basin thru Rybovitch/Spencer (Cut 36, 30+00 thru Cut 36, 97+13)							
HJ - Halophila johnsonii	3390	1850	2907	5240	8147	0.12	0.19
HD - Halophila decipens	83339	34605	4111	117944	122056	2.71	2.80
HJ w/ HD,HW	58667	11343	10631	70010	80641	1.61	1.85
HW	0	0	0	0	0	0.00	0.00
Total HJ Communities	62057	13193	13538	75250	88788	1.73	2.04
Area Total	145396	47798	17649	193195	210844	4.44	4.84
Main Channel - Federal Channel Portion (Cut 35, 0+00 thru Cut 36, 97+13)							
HJ - Halophila johnsonii	3390	2360	3912	5750	9662	0.13	0.22
HD - Halophila decipens	270516	52434	31957	322950	354907	7.41	8.15
HJ w/ HD,HW	60803	13126	16912	73929	90841	1.70	2.09
HW	0	0	3769	0	3769	0.00	0.09
Total HJ Communities	64193	15486	20824	79679	100503	1.83	2.31
Area Total	334709	67919	56550	402628	459178	9.24	10.54
Main Channel - F.I.N.D. Portion (Cut 36, 97+13 thru Cut 41, 7+50)							
HJ - Halophila johnsonii	9465	0	0	9465	9465	0.22	0.22
HD - Halophila decipens	36959	5820	1851	42779	44629	0.98	1.02
HJ w/ HD,HW	38537	0	1009	38537	39546	0.88	0.91
HW	0	0	0	0	0	0.00	0.00
Total HJ Communities	48002	0	1009	48002	49011	1.10	1.13
Area Total	84961	5820	2860	90781	93641	2.08	2.15
Comprehensive Main Channel - Florida Marine thru F.I.N.D. (Cut 35, 0+00 thru Cut 41, 7+50)							
HJ - Halophila johnsonii	12855	2360	3912	15215	19127	0.35	0.44
HD - Halophila decipens	307475	58253	33808	365728	399536	8.40	9.17
HJ w/ HD,HW	99340	13126	17922	112466	130387	2.58	2.99
HW	0	0	3769	0	3769	0.00	0.09
Total HJ Communities	112195	15486	21834	127681	149514	2.93	3.43
Area Total	419670	73739	59410	493409	552819	11.33	12.69

Overall Project Area Summary - All Facilities and Main Channel (Cut 35, 0+00 thru Cut 41, 7+50)

Seagrass Cover Class	Channel Perm (sqft)	1:3 Slope Perm (sqft)	1:3 Slope Temp (sqft)	Total Perm (sqft)	Total Area Impact (sqft.)	Est. Impact (ac.)	
						Perm	Total
HJ - <i>Halophila johnsonii</i>	21500	4608	6718	28108	32826	0.60	0.75
HD - <i>Halophila decipens</i>	378431	64140	46220	442571	488791	10.16	11.22
HW - <i>Halodule wrightii</i>	113	0	5941	113	6054	0.00	0.14
TT - <i>Thalassia testudium</i>	33217	2885	2953	36102	39055	0.83	0.90
SF - <i>Syringodium filiforme</i>	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	133386	20721	30373	154107	184479	3.54	4.24
HJ w/ SF,TT	316	116	162	432	594	0.01	0.01
HD/TT	31302	3727	6519	35029	41548	0.80	0.95
Mixed Seagrass w/o HJ	14556	2545	15319	17101	32420	0.39	0.74
Total HJ Communities	155202	25445	37253	180647	217899	4.15	5.00
Project Area Total	612821	98742	114204	711563	825767	16.34	18.96

Table 4. Project 14-Dredging Impacts on Seagrass Communities, Palm Beach County, FL

Seagrass Cover Class	Channel Perm (sqft)	1:3 Slope Perm (sqft)	Slope Temp (sqft)	Total Perm (sqft)	Total Area Impact (sqft.)	Est. Impact (ac.)	
						Perm	Total
Florida Marine							
HJ - Halophyllia johnsonii	0	0	0	0	0	0.00	0.00
HD - Halophyllia decipens	21740	4438	7885	26178	34063	0.60	0.78
HW - Halodule wrightii	0	0	11	0	11	0.00	0.00
TT - Thalassia testudium	12403	869	1533	13272	14805	0.30	0.34
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	8202	1169	272	9371	9643	0.22	0.22
HJ w/ SF,TT	0	0	0	0	0	0.00	0.00
HD/TT	13520	1771	3675	15291	18966	0.35	0.44
Mixed Seagrass w/o HJ	14520	5333	13685	19853	33538	0.46	0.77
Total HJ Communities	8202	1169	272	9371	9643	0.22	0.22
Facility Total	70385	13580	27061	83965	111026	1.93	2.55
Perry Technologies							
HJ - Halophyllia johnsonii	0	0	0	0	0	0.00	0.00
HD - Halophyllia decipens	41722	2758	4805	44480	49285	1.02	1.13
HW - Halodule wrightii	113	0	3522	113	3635	0.00	0.08
TT - Thalassia testudium	0	0	0	0	0	0.00	0.00
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	4557	2786	2566	7343	9909	0.17	0.23
HJ w/ SF,TT	0	0	0	0	0	0.00	0.00
HD/TT	12453	1814	865	14267	15132	0.33	0.35
Mixed Seagrass w/o HJ	36	649	1970	685	2655	0.02	0.06
Total HJ Communities	4557	2786	2566	7343	9909	0.17	0.23
Facility Total	58881	8007	13728	66888	80616	1.54	1.85
Charter School							
HJ - Halophyllia johnsonii	6268	2404	2162	8672	10834	0.20	0.25
HD - Halophyllia decipens	0	14	39	14	53	0.00	0.00
HW - Halodule wrightii	0	0	0	0	0	0.00	0.00
TT - Thalassia testudium	9196	539	144	9735	9879	0.22	0.23
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	18643	6424	7019	25067	32086	0.58	0.74
HJ w/ SF,TT	0	0	168	0	168	0.00	0.00
HD/TT	3177	934	361	4111	4472	0.09	0.10
Mixed Seagrass w/o HJ	0	0	0	0	0	0.00	0.00
Total HJ Communities	24911	8828	9349	33739	43088	0.77	0.99
Facility Total	37284	10315	9893	47599	57492	1.09	1.32
Rybovitch Marina							
HJ - Halophyllia johnsonii	2377	823	254	3200	3454	0.07	0.08
HD - Halophyllia decipens	7494	1927	856	9421	10277	0.22	0.24
HW - Halodule wrightii	0	0	0	0	0	0.00	0.00
TT - Thalassia testudium	11618	2587	1412	14205	15617	0.33	0.36
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	2644	1685	2652	4329	6981	0.10	0.16
HJ w/ SF,TT	316	173	216	489	705	0.01	0.02
HD/TT	2152	1932	954	4084	5038	0.09	0.12

Seagrass Cover Class	Channel Perm (sqft)	1:3 Slope Perm (sqft)	Slope Temp (sqft)	Total Perm (sqft)	Total Area Impact (sqft.)	Est. Impact (ac.)	
						Perm	Total
Mixed Seagrass w/o HJ	0	0	0	0	0	0.00	0.00
Total HJ Communities	5337	2681	3122	8018	11140	0.18	0.26
Facility Total	26601	9127	6344	35728	42072	0.82	0.97
Main Channel North of Turning Basin (Cut 35, 0+00 thru Cut 36, 7+50)							
HJ - Halophilla johnsonii	0	997	1051	997	2048	0.02	0.05
HD - Halophilla decipens	187177	34908	29125	222084	251209	5.10	5.77
HJ w/ HD,HW	2136	3491	6568	5627	12196	0.13	0.28
HW	0	0	3942	0	3942	0.00	0.09
Total HJ Communities	2136	4488	7621	6624	14245	0.15	0.33
Area Total	189313	39396	40687	228708	269395	5.25	6.18
Main Channel South of Turning Basin thru Rybovitch/Spencer (Cut 36, 30+00 thru Cut 36, 97+13)							
HJ - Halophilla johnsonii	3390	3271	3304	6661	9964	0.15	0.23
HD - Halophilla decipens	83339	61163	4673	144503	149175	3.32	3.42
HJ w/ HD,HW	58667	20048	12082	78715	90797	1.81	2.08
HW	0	0	0	0	0	0.00	0.00
Total HJ Communities	62057	23319	15386	85376	100762	1.96	2.31
Area Total	145386	84482	20059	229878	249937	5.28	5.74
Main Channel - Federal Channel Portion (Cut 35, 0+00 thru Cut 36, 97+13)							
HJ - Halophilla johnsonii	3390	4268	4355	7658	12013	0.18	0.28
HD - Halophilla decipens	270516	96071	33797	366587	400384	8.42	9.19
HJ w/ HD,HW	60803	23539	18652	84342	102994	1.94	2.36
HW	0	0	3942	0	3942	0.00	0.09
Total HJ Communities	64193	27807	23007	92000	115007	2.11	2.64
Area Total	334709	123878	60746	458587	519332	10.53	11.92
Main Channel - F.I.N.D. Portion (Cut 36, 97+13 thru Cut 41, 7+50)							
HJ - Halophilla johnsonii	9465	0	0	9465	9465	0.22	0.22
HD - Halophilla decipens	36959	10698	2108	47657	49765	1.09	1.14
HJ w/ HD,HW	38537	0	1150	38537	39686	0.88	0.91
HW	0	0	0	0	0	0.00	0.00
Total HJ Communities	48002	0	1150	48002	49152	1.10	1.13
Area Total	84961	10698	3258	95659	98917	2.20	2.27
Comprehensive Main Channel - Florida Marine thru F.I.N.D. (Cut 35, 0+00 thru Cut 41, 7+50)							
HJ - Halophilla johnsonii	12855	4268	4355	17123	21478	0.39	0.49
HD - Halophilla decipens	307475	106769	35905	414244	450149	9.51	10.33
HJ w/ HD,HW	99340	23539	19802	122879	142680	2.82	3.28
HW	0	0	3942	0	3942	0.00	0.09
Total HJ Communities	112195	27807	24157	140002	164158	3.21	3.77
Area Total	419670	134576	64003	554246	618249	12.72	14.19

Overall Project Area Summary - All Facilities and Main Channel (Cut 35, 0+00 thru Cut 41, 7+50)

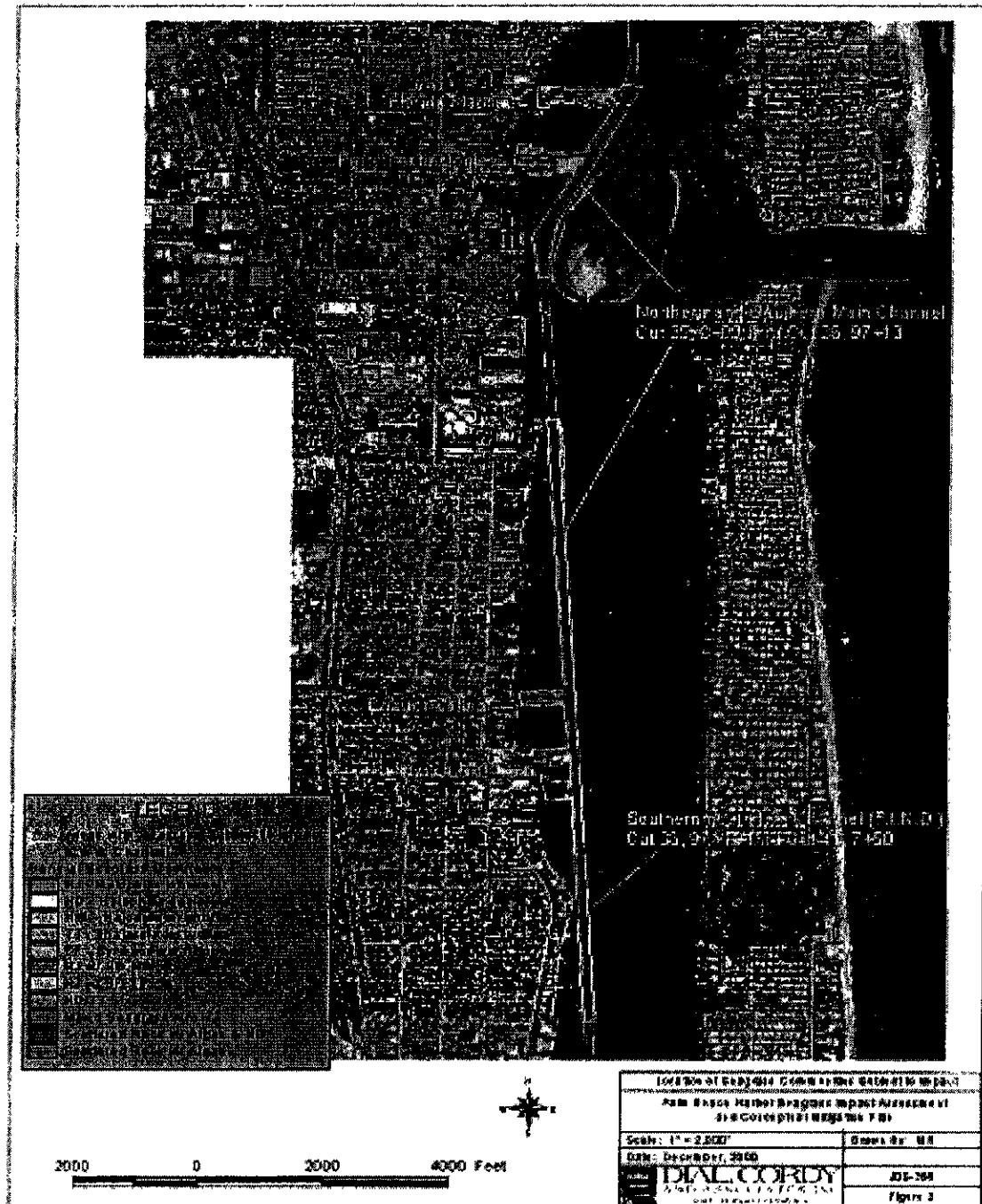
Seagrass	Channel	1:3 Slope	1:3 Slope	Total	Total Area		Est. Impact (ac.)
Cover Class	Perm (sqft)	Perm (sqft)	Temp (sqft)	Perm (sqft)	Impact (sqft.)	Perm	Total
HJ - Halophilla johnsonii	21500	7495	8771	28995	35766	0.67	0.82
HD - Halophilla decipens	378431	115906	49490	494337	543827	11.35	12.48
HW - Halodule wrightii	113	0	7475	113	7588	0.00	0.17
TT - Thalassia testudium	33217	3995	3089	37212	40301	0.85	0.93
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	133386	35603	32311	168989	201299	3.88	4.62
HJ w/ SF,TT	316	173	384	489	873	0.01	0.02
HD/TT	31302	6451	5855	37753	43608	0.87	1.00
Mixed Seagrass w/o HJ	14556	5982	15655	20538	36193	0.47	0.83
Total HJ Communities	155202	43271	39466	198473	237938	4.56	5.46
Project Area Total	612821	175605	121029	788426	909455	18.10	20.88

Table 5 Project 15-Dredging Impacts on Seagrass Communities, Palm Beach County, FL

Seagrass Cover Class	Channel Perm (sq ft)	1:3 Slope Perm (sq ft)	1:3 Slope Temp (sq ft)	Total Perm (sq ft)	Total Area Impact (sq ft)	Est Impact (ac)	
						Perm	Total
Florida Marine							
HJ - Halophilla johnsonii	0	0	0	0	0	0.00	0.00
HD - Halophilla decipens	21740	5160	8900	26900	35800	0.62	0.82
HW - Halodule wrightii	0	0	159	0	159	0.00	0.00
TT - Thalassia testudium	12403	1003	1882	13406	15288	0.31	0.35
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	8202	1242	376	9444	9820	0.22	0.23
HJ w/ SF,TT	0	0	0	0	0	0.00	0.00
HD/TT	13520	1955	4069	15475	19544	0.36	0.45
Mixed Seagrass w/o HJ	14520	5800	15327	20320	35647	0.47	0.82
Total HJ Communities	8202	1242	376	9444	9820	0.22	0.23
Facility Total	70385	15160	30713	85545	116258	1.96	2.67
Perry Technologies							
HJ - Halophilla johnsonii	0	0	0	0	0	0.00	0.00
HD - Halophilla decipens	41722	3238	4752	44960	49712	1.03	1.14
HW - Halodule wrightii	113	0	4359	113	4472	0.00	0.10
TT - Thalassia testudium	0	0	0	0	0	0.00	0.00
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	4557	2786	3374	7343	10717	0.17	0.25
HJ w/ SF,TT	0	0	0	0	0	0.00	0.00
HD/TT	12453	1814	1008	14267	15275	0.33	0.35
Mixed Seagrass w/o HJ	36	649	1970	685	2655	0.02	0.06
Total HJ Communities	4557	2786	3374	7343	10717	0.17	0.25
Facility Total	58881	8487	15463	67368	82831	1.55	1.90
Charter School							
HJ - Halophilla johnsonii	6268	2844	1837	9112	10949	0.21	0.25
HD - Halophilla decipens	0	20	44	20	64	0.00	0.00
HW - Halodule wrightii	0	0	0	0	0	0.00	0.00
TT - Thalassia testudium	9196	620	90	9816	9906	0.23	0.23
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	18643	7435	6755	26078	32833	0.60	0.75
HJ w/ SF,TT	0	0	242	0	242	0.00	0.01
HD/TT	3177	1080	244	4257	4501	0.10	0.10
Mixed Seagrass w/o HJ	0	0	0	0	0	0.00	0.00
Total HJ Communities	24911	10279	8834	35190	44024	0.81	1.01
Facility Total	37284	11999	9212	49283	58495	1.13	1.34
Rybovitch Marina							
HJ - Halophilla johnsonii	2377	904	172	3281	3453	0.08	0.08
HD - Halophilla decipens	7494	2372	644	9866	10510	0.23	0.24
HW - Halodule wrightii	0	0	0	0	0	0.00	0.00
TT - Thalassia testudium	11618	3023	1271	14641	15912	0.34	0.37
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	2644	1978	2747	4622	7369	0.11	0.17
HJ w/ SF,TT	316	209	251	525	776	0.01	0.02
HD/TT	2152	2235	617	4387	5004	0.10	0.11
Mixed Seagrass w/o HJ	0	0	0	0	0	0.00	0.00
Total HJ Communities	5337	3091	3170	8428	11598	0.19	0.27
Facility Total	26601	10721	5702	37322	43024	0.86	0.99

Seagrass Cover Class	Channel Perm (sq ft)	1:3 Slope Perm (sq ft)	1:3 Slope Temp (sq ft)	Total Perm (sq ft)	Total Area Impact (sq ft)	Est Impact (ac)	
						Perm	Total
Main Channel North of Turning Basin (Cut 35, 0+00 thru Cut 36, 7+50)							
HJ - Halophilla johnsonii	0	1256	990	1256	2246	0.03	0.05
HD - Halophilla decipens	187177	43947	27432	231124	258556	5.31	5.94
HJ w/ HD,HW	2136	4395	6188	6531	12719	0.15	0.29
HW	0	0	3713	0	3713	0.00	0.09
Total HJ Communities	2136	5650	7178	7787	14964	0.18	0.34
Area Total	189313	49597	38323	238910	277233	5.48	6.36
Main Channel South of Turning Basin thru Rybovitch/Spencer (Cut 36, 30+00 thru Cut 36, 97+13)							
HJ - Halophilla johnsonii	3390	3441	3314	6831	10145	0.16	0.23
HD - Halophilla decipens	83339	64354	4687	147693	152380	3.39	3.50
HJ w/ HD,HW	58667	21094	12120	79761	91881	1.83	2.11
HW	0	0	0	0	0	0.00	0.00
Total HJ Communities	62057	24535	15434	86592	102026	1.99	2.34
Area Total	145396	88889	20121	234285	254406	5.38	5.84
Main Channel - Federal Channel Portion (Cut 35, 0+00 thru Cut 36, 97+13)							
HJ - Halophilla johnsonii	3390	4697	4304	8087	12391	0.19	0.28
HD - Halophilla decipens	270516	108301	32119	378817	410936	8.70	9.43
HJ w/ HD,HW	60803	25489	18308	86292	104599	1.98	2.40
HW	0	0	3713	0	3713	0.00	0.09
Total HJ Communities	64193	30185	22612	94379	116990	2.17	2.69
Area Total	334709	138486	58443	473195	531639	10.86	12.20
Main Channel - F.I.N.D. Portion (Cut 36, 97+13 thru Cut 41, 7+50)							
HJ - Halophilla johnsonii	9465	0	0	9465	9465	0.22	0.22
HD - Halophilla decipens	36959	11231	2360	48190	50549	1.11	1.16
HJ w/ HD,HW	38537	0	1287	38537	39824	0.88	0.91
HW	0	0	0	0	0	0.00	0.00
Total HJ Communities	48002	0	1287	48002	49289	1.10	1.13
Area Total	84961	11231	3647	96192	99838	2.21	2.29
Comprehensive Main Channel - Florida Marine thru F.I.N.D. (Cut 35, 0+00 thru Cut 41, 7+50)							
HJ - Halophilla johnsonii	12855	4697	4304	17552	21856	0.40	0.50
HD - Halophilla decipens	307475	119532	34479	427007	461485	9.80	10.59
HJ w/ HD,HW	99340	25489	19595	124828	144423	2.87	3.32
HW	0	0	3713	0	3713	0.00	0.09
Total HJ Communities	112195	30185	23899	142380	166279	3.27	3.82
Area Total	419670	149717	62090	569387	631477	13.07	14.50
Overall Project Area Summary - All Facilities and Main Channel (Cut 35, 0+00 thru Cut 41, 7+50)							
Seagrass Cover Class	Channel Perm (sqft)	1:3 Slope Perm (sqft)	1:3 Slope Temp (sqft)	Total Perm (sqft)	Total Area Impact (sqft.)	Perm	Est. Impact (ac) Total
HJ - Halophilla johnsonii	21500	8445	6313	29945	36258	0.69	0.83
HD - Halophilla decipens	378431	130322	48819	508753	557571	11.68	12.80
HW - Halodule wrightii	113	0	8231	113	8344	0.00	0.19
TT - Thalassia testudium	33217	4646	3243	37863	41106	0.87	0.94
SF - Syringodium filiforme	0	0	0	0	0	0.00	0.00
HJ w/ HD,HW	133386	38930	32847	172315	205162	3.96	4.71
HJ w/ SF,TT	316	209	493	525	1018	0.01	0.02
HD/TT	31302	7084	5938	38386	44324	0.88	1.02
Mixed Seagrass w/o HJ	14556	6449	17297	21005	38302	0.48	0.88
Total HJ Communities	155202	47583	39653	202785	242438	4.66	5.57
Project Area Total	612821	196084	123180	808905	932085	18.57	21.40

Figure 2 Location of Seagrass Communities Subject to Impact



3.1.1 Federal Section

Total estimated seagrass impacts for the four incremental dredging depths (Projects 10,12, 14, and 15) are 9.24 acres, 10.54 acres, 11.92 acres, and 12.20 acres, respectively. Temporary impacts accounted for 10-12% of the total impacts. Total impacts to *H. johnsonii* ranged from 1.97 acres for the Project 10 depth (12 feet) to 2.69 acres for the maximum Project 15 (17-foot) depth. Impacts to *H. decipiens* accounted for over 70% of the total area of seagrass impact. Temporary impacts were also highest in this section of the AIWW due to the high occurrence of *H. decipiens* within and adjacent to the channel in the northern reach of this section near Peanut Island.

3.1.2 FIND Section

Total estimated seagrass impacts for the four incremental dredging depths (Projects 10,12, 14, and 15) are 2.05 acres, 2.15 acres, 2.27 acres, and 2.29 acres, respectively. Temporary impacts accounted for less than 5% of the total impacts. Total impacts to *H. johnsonii* ranged from 1.12 acres for the Project 10 depth (12 feet) to 1.13 acres for the maximum Project 15 depth (17 feet). Due to the infrequent occurrence of seagrass outside the immediate channel, increasing the dredge depth did not greatly increase the seagrass impact. Impacts to *H. decipiens* accounted for approximately 45% of the total area of seagrass impact.

3.2 Facilities

Facilities where seagrass impacts will occur from any dredging include Florida Marine, Perry Technologies, Charter School, and Rybovitch Marina. No seagrass was found within the Palm Beach Municipal Marina survey area. Table 1 summarizes the impacts for each incremental depth. Tables 2-5 document the incremental impacts for each dredging depth specific to each facility for all seagrass cover types found. Figure 2 illustrates the location of seagrass community impacts.

3.2.1 Florida Marine

Total seagrass impacts for each of the four (12, 14, 15, and 17-foot) incremental depths analyzed include 2.12 acres, 2.41 acres, 2.55 acres, and 2.67 acres. Of the total impacts, those associated with *H. johnsonii* only are 0.22 acre for the first three depths and 0.23 acre for the 17-foot increment (Project 15). Temporary impacts for each of the four dredging increments include 0.50 acre, 0.62 acre, 0.62 acre, and 0.71 acre and on the average account for 30% of the total impact acreage. A majority of the impacts are to *H. decipiens*, either as monospecific beds or in association with other species.

3.2.2 Perry Technologies

Total seagrass impacts for each of the four (12, 14, 15 and 17-foot) incremental depths analyzed include 1.60 acres, 1.72 acres, 1.85 acres, and 1.90 acres. Of the total impacts, those associated with *H. johnsonii* only are 0.17 acre, 0.20 acre, 0.23 acre, and 0.25 acre for the four incremental depths, respectively. Temporary impacts for each of the four dredging increments include 0.25 acre, 0.28 acre, 0.31 acre, and 0.35 acre, and on the average account for 16% of the total impact acreage. A majority of the impacts are to *H. decipiens*, either as monospecific beds or in association with other species.

3.3.3 Charter School

Total seagrass impacts for each of the four (12, 14, 15, and 17-foot) incremental depths analyzed include 1.18 acres, 1.24 acres, 1.32 acres, and 1.34 acres. Of the total impacts, those associated with *H. johnsonii* only are 0.86 acre, 0.92acre, 0.99 acre, and 1.01 acres for the four incremental depths, respectively. Temporary impacts for each of the four dredging increments include 0.24 acre, 0.22 acre, 0.23 acre, and 0.21 acre, and on the average account for 17% of the total impact acreage. Seagrass species impacted other than *H. johnsonii* included *Thalassia testudinum* and mixed associations with *H. decipiens* and *H. wrightii*.

3.3.4 Rybovitch Marina

Total seagrass impacts for each of the four (12, 14, 15, and 17 foot) incremental depths analyzed include 0.82acre, 0.89 acre, 0.97 acre, and 0.99 acre. Of the total impacts, those associated with *H. johnsonii* only are 0.20 acre, 0.22 acre, 0.26 acre, and 0.27 acre for the four incremental depths, respectively. Temporary impacts for each of the four dredging increments include 0.14 acre, 0.13 acre, 0.15 acre, and 0.13 acre, and on the average account for 15% of the total impact acreage. Seagrass species impacted other than *H. johnsonii* included monospecific beds of *Thalassia testudinum* and *H. decipiens*, and various mixed associations of seagrass species.

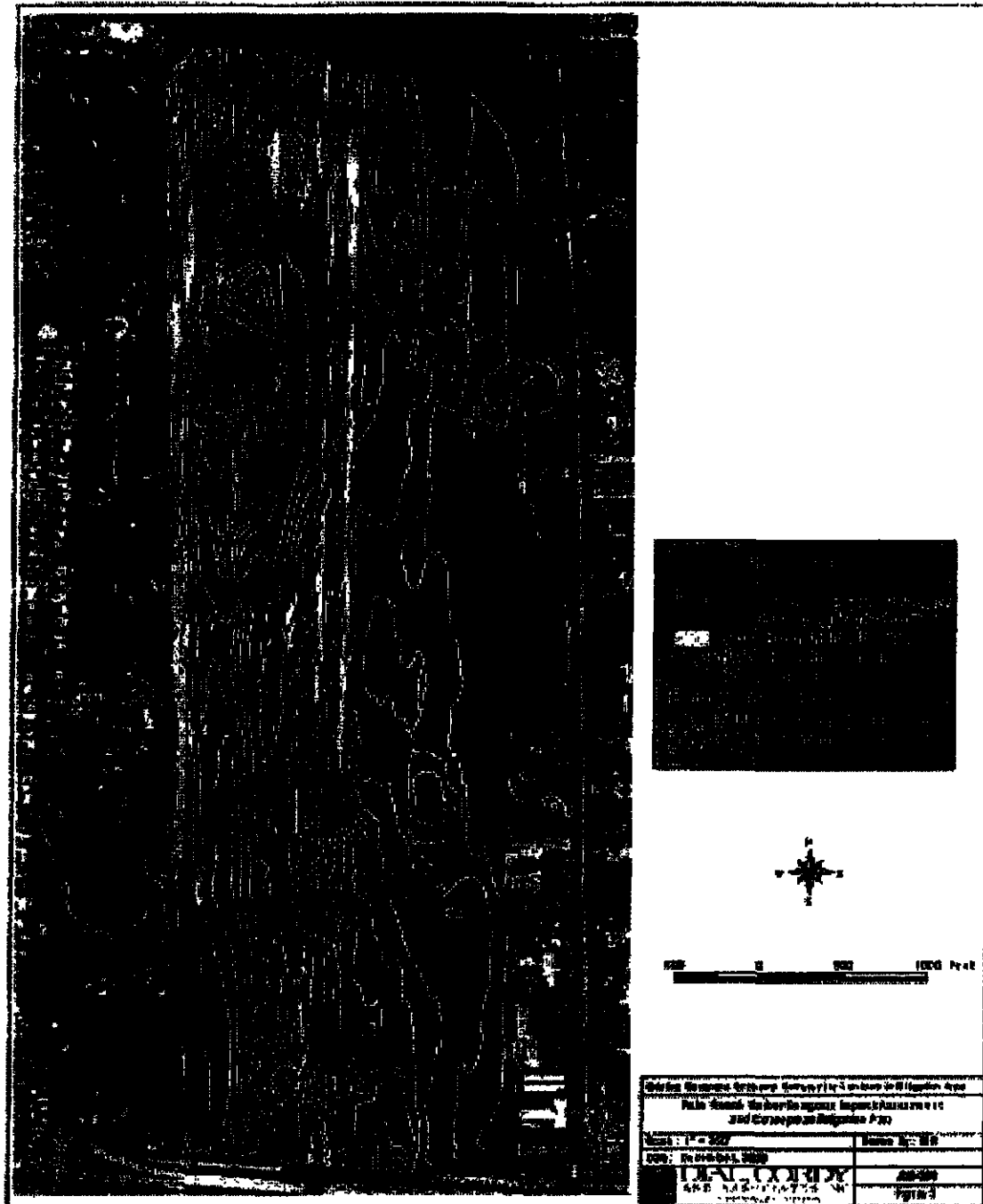
4.0 CONCEPTUAL MITIGATION PLAN

This section includes a description of the existing site conditions, conceptual restoration design, ecological benefits, success criteria and proposed monitoring protocol.

4.1 Site Description

The proposed mitigation area is located just north of the Florida Highway 802 Bridge along the west side of the AIWW (Figure 1). The site is designated as a spoil disposal area on the NOAA chart and as such has been used in the past for fill and disposal purposes. Bathymetric contour maps of the mitigation area and AIWW channel illustrate the considerable variation in depths on each side of the federal channel (Figure 3). While the eastern shore averages less than 6 feet below MSL, the area proposed for seagrass restoration on the west side of the channel averages greater than 10 feet below MSL and has some deeper holes exceeding 20 feet in depth. Sediment is characterized as fine sand with some silt-clay. Water clarity is limited ranging from 2-4 feet depending on the tidal stage and extent of discharge from C-51 canal, located 8 miles south of Palm Beach Harbor.

Figure 3 Existing Seagrass Beds and Bathymetric Contours in Mitigation Area



Based on diver transects within the area west of the channel (Dial Cordy 2000), seagrass occurred only immediately close to shore in less than 5 feet below MSL (Figure 3). Except at the southern end of the site where a mixed seagrass community of *H. johnsonii* with *H. decipiens* and *H. wrightii* occurred, the remaining seagrass cover occurred as monospecific beds of *H. decipiens*, *H. wrightii*, and *H. johnsonii*. Seagrass frequency of occurrence, cover abundance, and density values were measured at five stations surveyed in the proposed mitigation area (Dial Cordy 2000). For *H. johnsonii* frequency of occurrence was 47%, abundance was 0.75, and density was 0.30 at the two stations where observed. For *H. wrightii*, values for frequency of occurrence, abundance, and density were 75% (n=1), 1.50, and 0.30, respectively. *H. decipiens* values were 53% (n=2), 2.00, and 0.80, respectively for frequency of occurrence, abundance, and density.

4.2 Proposed Restoration Design

With a goal of restoring shallow water habitat suitable for the propagation of seagrass species, the proposed design includes using suitable dredge spoil from the proposed channel dredging to raise the existing bottom elevation to depths where, based on survey, seagrass habitat can be either physically planted or allowed to naturally recruit (Figures 4-7). As the depths where seagrass presently occurs ranges from 2-4 feet MSL, filling the spoil site to these elevations to create shallow habitat where light levels are adequate to support photosynthetic production is the basis for the design. To protect planting units and naturally recruited seagrass a narrow subtidal berm will be constructed with fill material landward of the channel (Figures 4-7). This berm will serve to dampen wave energy from boat wakes, thereby protecting planting areas from excessive turbulence, which might disrupt planted seagrass. This approach is being attempted in Tampa Bay as a means of increasing seagrass survival following planting and promoting more rapid recruitment.

In order to expedite natural recruitment, which we expect to occur, seagrass will be relocated from the areas where dredging will occur (donor sites), transplanted in peat pots per methods described in Fonseca et al (1998), and installed in one meter square units throughout the restoration area. Due to the small size and anticipated difficulty in relocating *H. johnsonii*, it is anticipated that seagrass donor sites will be principally located in dense to moderately dense mixed beds of *H. wrightii*, *H. decipiens* and *H. johnsonii*. Peat pots of seagrass will be relocated by divers from the donor sites where dredging is proposed, transported to the restoration site by boat and planted in one meter square plots west of the constructed berm.

One year prior to dredging a pilot study will be conducted to transplant seagrass from donor areas to the shallow areas adjacent to the restoration site. Planting units installed will be covered with wire mesh enclosures to prevent predation and bioturbation. Maintenance of the enclosures will be monthly with monitoring and enclosure removal one year following planting. Planting will include use of donor material from all three species. The results of the study will be used to design the planting methodology for the site restoration. It is anticipated that the full scale planting will include installation of planting units over 5-10% of the total 100 area site. Details of restoration techniques are provided in Fonseca et al (1998) and will be adhered to for this project. Detailed restoration plans and specifications and a monitoring plan for the pilot study should be prepared and thoroughly peer reviewed by experts in seagrass ecology and restoration prior to implementation.

Figure 4 Proposed bathymetric Contours and Estimated Area (ac) to be Filled

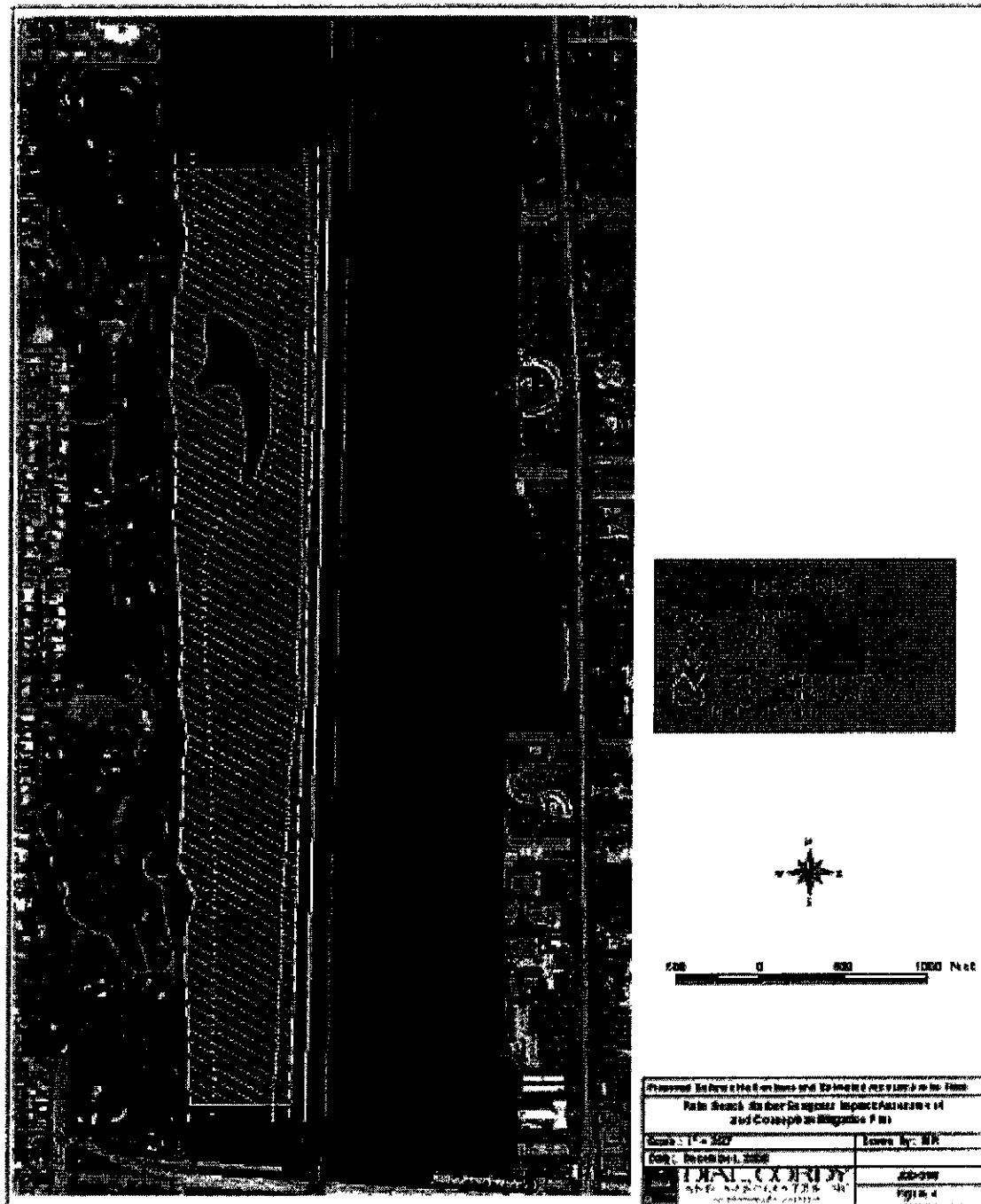


Figure 2 is a cross-section diagram (A-A') showing the proposed and existing contours of a wetland area. The vertical axis represents elevation in feet, ranging from Mean Sea Level (MSL) down to -25'. The horizontal axis represents distance in feet, with a scale bar indicating 0, 100, and 200 feet. The 'Existing Contour' is shown as a solid line, and the 'Proposed Contour' is shown as a dashed line. Key features include a 'Slope Break at -5' MSL', a 'Slope Break at -12' MSL', and a '1:2 Slope' on the right side. A 'Project 10 Alternative' is indicated by a dashed line. A '2'-3' slope' is noted on the left side. A 'Scale bar' is provided at the bottom right, and a 'North arrow' is located below the scale bar. The diagram is labeled 'Approx. 10x Vertical Exaggeration'.

Figure 6 Typical Cross-Section View of Existing and Proposed Elevations (B-B¹)

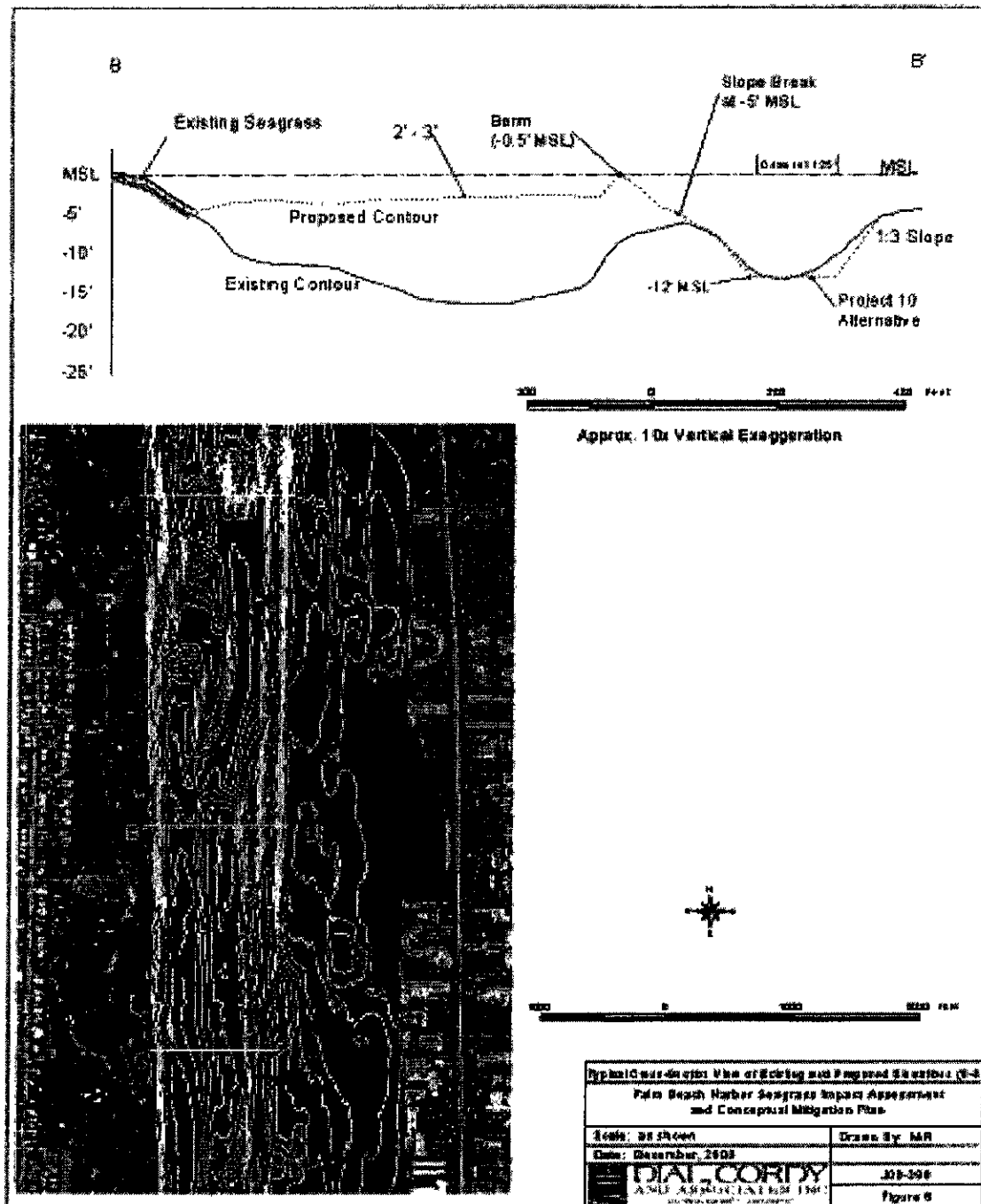
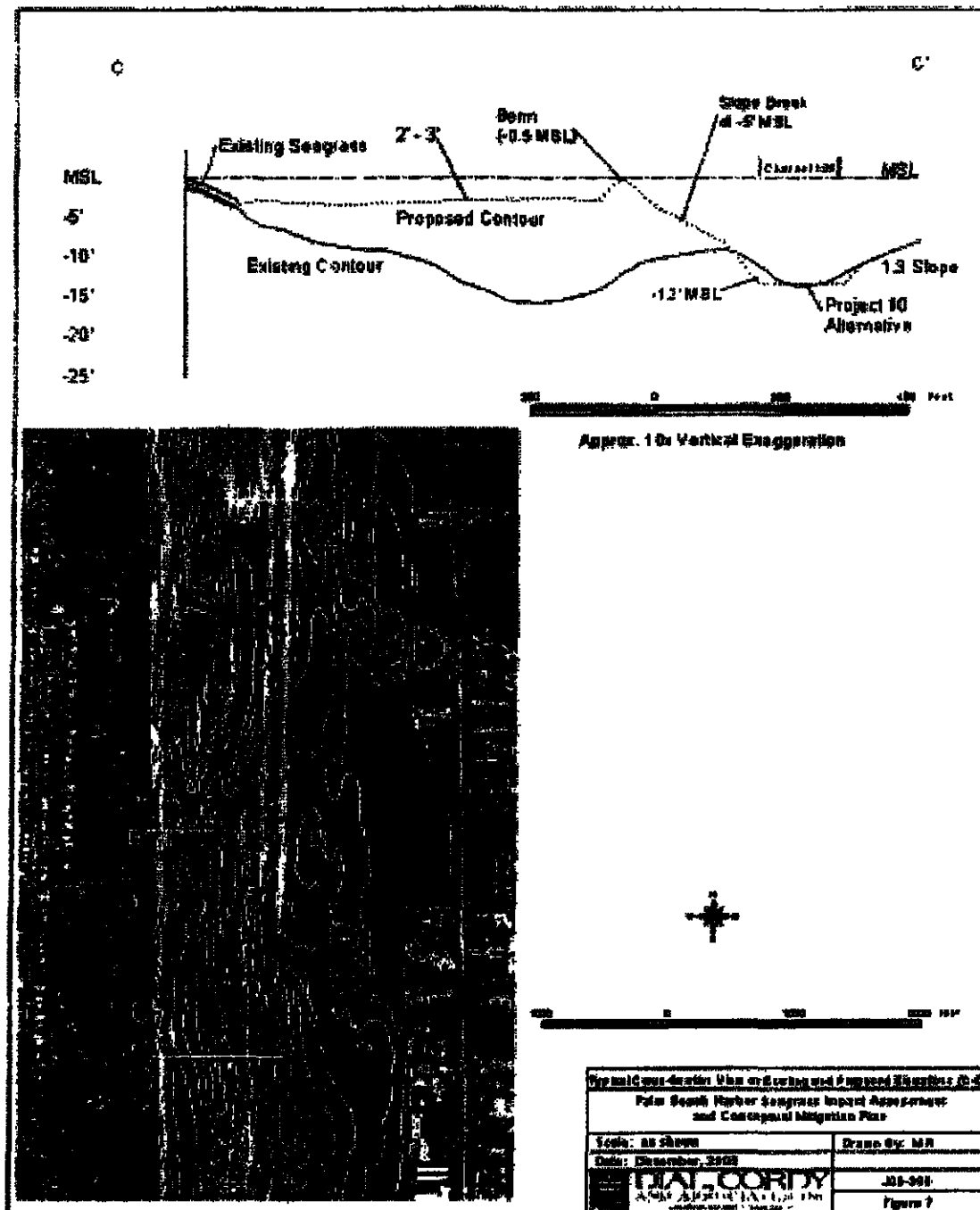


Figure 7 Typical Cross-Section View of Existing and Proposed Elevations (C-C¹)



4.3 Ecological Benefits of Restoration

The ecological benefits of seagrass beds to insular and offshore fisheries, primary production and general food chain support are well known (Zieman 1982). Filling in deep holes and raising the bottom elevation to the photic zone will greatly increase the abundance and diversity of the macrobenthic community which will in turn increase secondary production of larger motile invertebrates and demersal finfish. As a majority of the site is below the photic zone, under anaerobic conditions and with no benthic algae or seagrass present, restoring shallow water habitat will also increase primary production in Lake Worth, as much of the area will be colonized by marine algae and seagrass.

4.4 Success Criteria

The following success criteria are recommended for consideration. These in part are based upon recognition that successful seagrass restoration will require continued replanting for several years to achieve success (Fonseca et al 1998). Success will be defined as the persistence of the required acreage of seagrass coverage for a prescribed period of time, which will be five years for this project.

- Within 1 year after restoration benthic algae and seagrass will be present and expanding from the installed areas and if less than 50 % then additional planting units are to be installed to achieve 75%. Aerobic conditions and active reworking of surficial sediments will be apparent within 1 year of planting.
- Fifty percent of the installed seagrass units have survived and are actively expanding after 2 years and if less than 50 % then additional planting units are to be installed to achieve at least 75 %.
- Sixty percent survival is achieved after 3 years with additional planting as necessary to achieve 75%.
- Sixty-five percent survival is achieved after 4 years with additional planting as necessary to achieve 75%.
- Seventy-five percent survival achieved after 5 years with additional planting as necessary to achieve 75%.
- In the event 75 % survival has not been achieved through replanting efforts five years after planting, consultation with NMFS will be initiated for corrective actions required.

4.5 Monitoring Plan

The monitoring plans presented below are for the pilot study and the full -scale restoration. Monitoring of plant performance for both efforts should utilize standard methods, which best allows for mid-course corrections and improved planning for the major full-scale project (Fonseca et al 1998).

4.5.1 Pre- Dredging Pilot Study

Monitoring should be conducted quarterly for at least one year to determine the percent survival of planting units within each plot, the number of shoots per planting unit and areal coverage. Enclosures should be checked and cleaned monthly if used. Physical/ chemical parameters measured should include conductivity, temperature, dissolved oxygen, and PAR levels. Sediment grain-size and organic content should be sampled at available donor sites and the recipient sites to assess preferences by seagrass species for sediment type. A report summarizing the results of the pilot study should be completed prior to dredging so adequate time is available to adjust the planting techniques and monitoring methodology.

4.5.2 Full Scale Restoration

Pre-Dredging

Prior to dredging a survey should be conducted of proposed donor sites and the restoration site prior to filling in order to establish baseline levels for salinity, dissolved oxygen, PAR, grain-size distribution and organic content.

Post- Restoration

Within 1 year of filling the restoration site with dredged material and capping it with fine sand, the site will have been planted with seagrass planting units in one meter square plots. GPS coordinates will be taken at all planting plot locations to facilitate locating each month. Monthly for the first year only, enclosures will be placed over seagrass plots. Sites will be visited monthly to clean enclosures and to generally note conditions of the plots. On a quarterly basis for the first year and biannually thereafter for five years each plot will be surveyed to estimate percent survival, expressed as shoot numbers, area covered per planting unit and shoot density of the planted seagrass, as well as observe any areas where natural recruitment has occurred. Information will be obtained from all plots and recorded for later analysis. Once planting units begin to coalesce and the installed units can not be discerned, areal coverage and shoot density should be recorded and counts on a planting unit basis suspended. During the first year after the initial planting, physical, chemical and geological

data and or samples will be collected as was done for the pilot study at selected donor sites. This information will be compared to long-term data collected from the restoration site. A ledger will be maintained annually as to number planting units installed each year and the number replanted.

Annual monitoring will be conducted for five years to insure success criteria are met. Monitoring will include survival estimates based on survey of at least 70 % of the meter plot areas, general observations as to the growth and maturation of the planting units, and chemical, sediment and PAR levels at three planting sites within the restoration area. Specific recommendations for monitoring are found in Fonseca et al (1998). Remedial planting will likely be higher the first year and taper off the second and third years. Benthic sampling will occur after the third year of monitoring, with samples pulled from the restoration site and adjacent to the site. Species abundance and richness will be calculated following taxonomic identification. Annual reports will be submitted with an analysis of restoration efforts to date, assessment of plant survival, replanting requirements and recommendations for site improvements.

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